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UNDERSTANDING AND TRANSFORMING THE TERRITORY

New Approaches and Perspectives

A APROPRIAÇÃO E A TRANSFORMAÇÃO DO TERRITÓRIO

Novas Abordagens e Perspetivas

Carlos Smaniotto Costa & Nagayamma Aragão

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FOREWORD

It is our great pleasure to present the fifth volume of the Culture & Territory Series. **Understanding and Transforming the Territory – New Approaches and Perspectives** is a home-made product born from the challenge presented to researchers, PhD and master's students in Urban Planning and the external advisers to discuss their recent research. This volume is organised by the research group *CIDATE - Citizen Science in understanding and transforming the territory* of Universidade Lusófona, Lisbon/Portugal. The various chapters reflect innovative and incipient insights into our research, both individually and in teams. Creating opportunities to debate the use, appropriation, assigned values and management of the territory intertwined with citizen science are central issues for CIDATE.

This volume also experienced the negative impact of the COVID-19. The pandemic disrupted its production process causing successive delays and adjustments.

This volume thus has a dual goal. It is a means to stimulate an integrated and holistic approach to a responsible use of the territory and its resources, while widening the scope of knowledge construction and production of *places* in contemporary society – both aims backed by recent research carried out at CIDATE and in the post--graduation in Urban Planning. The chapters describe and demonstrate foundational new approaches to development problems, broadening the perspectives to community-based research, to ask how to make socially responsive environments.

The interdisciplinary nature of this book is both a strength and a challenge. The volume is divided into three parts. While in the first part, **New approaches**, individual contributions bring up insights from recent and/or ongoing empirical research, the second part, **Research Synthesis Report**, discusses the rationale, approaches and results of two research projects, thus paving the way to the third part, **Essays**, which gathers contributions addressing the rationale of citizen science and its opportunities for socio-spatial studies, as well as the territorial perspectives underlying the recent work of the External Advisors of our research group. Together, therefore, the chapters in these three parts explore some key perspectives for the debate about more responsible approaches to the territory and its resources.

Outline of the book chapters

The chapters in part one deal with recent and novel approaches adopted by researchers at CIDATE and by Urban Planning graduate students.

Inês Almeida, Ana Loureiro and **Rosário Rosa** outline in **"Elderly people's use of urban greenspaces and perception of health and quality of life"** a concise approach to advance knowledge on the relationship between older adults' use of public greenspaces and their perception of quality of life and mental well-being.

Luísa Araújo offers in **"From the financial and economic crisis to the health crisis. Impacts on the real estate industry and its effects on the national territory"** a detailed look at the changes in economic and financial situation caused by the subprime crisis and the subsequent national austerity measures. Araújo analyses how these conditioned the construction and real estate sectors in Portugal, stating that with this effect there is in the national context the ability to adapt and resist, in light of activities in these two sectors.

Ircilia Anauria Nazareth Garrido in **"Territory evolution and transformation. Miscegenation as a driving factor for the creation of urban regeneration projects"** addresses "miscegenation" - the mix or combination of different uses and functions that provoke incoherencies in urban fabric - and the potential of such mixes for guiding urban regeneration projects.

In the chapter ***"Informal transport in São Tomé and Luanda. The territorial dimension in the public transport system"*** **Nagayamma Aragão** and **Diogo Mateus** address the dynamics of informal transport sectors in Africa to propose a model of integrated spatial management, one that promotes greater justice and social equity.

Celestino Domingos Tavares Silva discusses in **"Normative instruments for land and urban planning in Cape Verde: An analysis from a more pertinent intervention path"** the Cape Verdean planning system, its potential and failures. Tavares Silva provides a reflection on a foundation for planning normative more adapted to the reality of the country.

Pedro Afonso Fernandes in **"Programming the Logic of Space: A new approach to space syntax"** puts forward a new path to perform syntactic analyses, one that may be more appropriate for social research as it uses statements instead of drawings or matrices. Fernandes uses Lisbon's neighbourhood Areeiro as a study case to pose questions and answers about the social and economic consequences of spatial design.

Part two contains the reports of two research projects:

In **"A review of urban river restoration projects. Practices and challenges"**, **António D'Orey**, **Nagayamma Aragão** and **Carlos Smaniotto Costa** provide a discussion, based on worldwide research, on new ways of treating rivers under urban pressures. It examines interventions in rivers through the lens of environment, planning, technology, and societies. This review is a result of the Project Base Platform Urban Rivers – baseRiU, which aimed to expand the body of knowledge at CIDATE dedicated to the research and ways to approach urban rivers, and thus provide a sound base to guide the research to be carried out in the Project Cyted RUN (Renatured Urban Rivers).

In **"Towards city resilience, food security and territorial learning. Three territorial paradigmatic shifts triggered by the COVID-19 pandemic"**, **Sandrine Simon** discusses the rationale for her research project, which, focussing on Urban Agriculture in Lisbon, is analysing the potential of another strategic thinking that could facilitate a more sustainable food system. The research design encompasses tackling sustainable agriculture and circularity of activities toward the empowerment of citizens, who equipped with 'soft skills' would be able to solve local problems better – enriching Territorial Education with this experience.

Part three, Essays, brings an overview of the issues the members of CIDATE, of the External Advisory Board and invited authors are working on, and their contribution to socio-territorial studies.

This section starts with the essay by **Sandrine Simon, Tiago Duarte, Sónia Vladimira Correia, Pedro Afonso Fernandes, Carlos Smaniotto Costa** and **Zuinder Manico** on **"The potential of citizen science for socio-spatial studies. Defining and operationalising research pathways"**. This collaborative essay gathers the issues that emerged from a series of debates organised in 2021 and from research projects carried out by the authors, towards creating a broad understanding of the key issues that help operationalise citizen science in CIDATE's future research efforts.

In their essay **"Escape from labs: How to expand the territory of brain research?"**, **Agnieszka Kruszwicka** and **Michal Klichowski** call for expanding the research on brain activities to spaces outside laboratories. In the wake of advancements in digital and mobile technologies, the authors propose to explore new territories, as they call in (ordinary) everyday spaces.

Monica Bocci in **"Social responsibility and underground heritage valorisation in small rural communities: Lessons from two Italian cases"** presents two case studies of underground heritage to question how social responsibility could provide support for engaging communities and tourism stakeholders in developing a more sustainable approach to rural tourism.

In **"A framework to grasp socio-territorial relationships: a conceptual path"** Marluci Menezes addresses, from the perspective of the anthropology of space, the relevance of walking as a research method to trigger sensitive insights and to better understand some aspects of people's everyday relations with spaces.

Jacques Galhardo reflects in his essay **"How daily life impacts social science"** on the concept of daily life as a relationship between time and space, with a view to broadening the understanding of gentrification, fragmentation and segregation. He backs up his arguments by stating that a conflict of temporalities – among different factors – could be one possible reason.

The editors, Carlos Smaniotto Costa and Nagayamma Aragão, are indebted to the contributors of this book, who not only worked their issues creatively and with scientific rigor, but also put their trust in our leadership and editorial competences. In addition, we wish to acknowledge the work of the External Advisors of CIDATE, who helped us with peer reviewing the chapters, thus ensuring their integrity, accuracy and excellence, and providing further support for young researchers.

We hope you enjoy the read. Let us know what you think about the issues and results discussed in these essays.

Carlos Smaniotto Costa

Nagayamma Aragão

APRESENTAÇÃO

É com prazer que apresentamos o quinto volume da Série Cultura & Território. **A Apropriação e Transformação do Território – Novas Abordagens e Perspetivas** nasce do repto lançado aos investigadores, doutorandos e mestrandos em Urbanismo e consultores externos – para a partilha das investigações científicas. Este volume é organizado pela coordenação do grupo multidisciplinar de investigação *CIDATE - Ciência Cidadã na compreensão e transformação do território* do Urbanismo na Universidade Lusófona em Lisboa. Devido ao contexto atual, de forte limitação e conjuntura provocada pela pandemia COVID-19, o processo de produção deste volume foi condicionado a sucessivos atrasos e reajustes.

Os capítulos refletem perceções inovadores e incipientes da nossa pesquisa, tanto a nível individual como coletivo. Este volume pretende debater o uso, apropriação e gestão territorial, bem como os valores e significados atribuídos ao território e o papel da ciência cidadã na territorialização - questões centrais na investigação do grupo CIDATE.

Este volume tem um duplo objetivo: pretende estimular a divulgação de novas abordagens, integradas e holísticas, no uso eficiente do território e dos seus recursos; e visa alargar a construção do conhecimento na produção de *lugares* na sociedade contemporânea – ambos objetivos amparados por recentes trabalhos de investigação realizados no CIDATE e na formação em Urbanismo. Os capítulos descrevem e demonstram novas abordagens, fundamentais para a resolução de problemas de desenvolvimento, ampliam as perspetivas para a pesquisa baseada na comunidade e concretizam ideias para ambientes mais responsivos e justos.

A natureza interdisciplinar deste volume é, ao mesmo tempo, a sua força e um desafio. Ele é composto por três partes: **Novas Abordagens** retrata trabalhos recentes e/ou em curso na condução de pesquisas empíricas; a segunda, **Relatórios de Projetos** apresenta o relato de dois projetos de investigação, enquanto a terceira, **Ensaios** inclui contribuições que abordam os fundamentos da ciência cidadã e as oportunidades para estudos sócio-espaciais, bem como as perspetivas territoriais nos recentes trabalhos dos membros do conselho de Consultores Externo do nosso grupo de pesquisa.

Juntos, portanto, os contributos dessas três partes apontam perspectivas-chave para o debate e adoção de abordagens mais sustentáveis no desenvolvimento e gestão de recursos territoriais – através da ciência conectada ao território e aos potenciais locais.

Resumo dos capítulos do livro

Os capítulos da primeira parte têm como tema o desenvolvimento de novas abordagens e propor soluções. São trabalhos realizados por doutores, doutorandos e alunos de pós-graduação em Urbanismo:

Inês Almeida, **Ana Loureiro** e **Rosário Rosa** delineiam em **"Uso de espaços verdes urbanos pelas pessoas idosas e sua perceção de saúde e qualidade de vida"** uma abordagem para explorar a relação entre a perceção de qualidade de vida e bem-estar mental das pessoas idosas e a sua utilização de espaços públicos verdes.

Luísa Araújo oferece em **"Da crise financeira e económica à crise sanitária. Impactos no sector imobiliário e os seus efeitos no território nacional"** uma visão sobre a conjuntura económica e financeira provocada pela crise do subprime e as subsequentes medidas de austeridade nacional, e como estas condicionam os setores da construção e imobiliário. Araújo também analisa como a crise sanitária vem abalar o quadro de retoma económica em Portugal, mas cujo efeito revela existir no contexto nacional uma certa capacidade de adaptação e de resistência, por parte da atividade do sector imobiliário e da construção.

Ircilia Anauria Nazareth Garrido em **"Evolução e transformação do território. A "miscigenação" como fator impulsionador para criação de projetos de regeneração urbana"** aborda a ideia de miscigenação, a combinação de diferentes usos e funções que se traduzem em incoerência no meio urbano. Garrido propõe considerar a miscigenação como elemento orientador na conceção de projetos de regeneração urbana.

Nagayama Aragão e **Diogo Mateus** no capítulo **"O transporte coletivo informal em São Tomé e Luanda. A dimensão territorial do sistema de transporte público"** abordam as dinâmicas dos sistemas de transporte informal para a criação de um modelo de gestão integrado do sistema de transporte, a fim de promover maior justiça e equidade social.

Celestino Domingos Tavares Silva teoriza em **"Instrumentos normativos para o ordenamento do território e urbanismo em Cabo Verde. Uma análise a partir de um circuito mais pertinente de intervenção"** o sistema de planeamento cabo-verdiano, as suas potencialidades e falhas. O capítulo traz uma reflexão sobre as diretrizes estratégicas para um normativo de planeamento ajustado à realidade nacional.

Pedro Afonso Fernandes em **"Programming the Logic of Space: A new approach to space syntax"** propõe uma nova abordagem para análises sintáticas, porventura, mais apropriada para a pesquisa sócio-espacial no sentido em que utiliza declarações em vez de desenhos ou matrizes. Fernandes usa o bairro lisboeta

do Areeiro para colocar questões e delinear respostas sobre as consequências sociais e económicas do desenho urbano.

Na segunda parte são apresentados os relatórios de dois projetos de investigação:

António D'Orey, **Nagayamma Aragão** e **Carlos Smaniotto Costa** trazem para discussão em **"A review of urban river restoration projects. Practices and challenges"** os resultados da investigação sobre formas de envolvimento das comunidades locais na regeneração dos rios sob pressão da urbanização. Feita à escala mundial esta pesquisa é resultante do Projeto **Plataforma Base Rios Urbanos - baseRiU** que teve como objetivo ampliar o corpo de conhecimento dedicado à investigação sobre rios urbanos no CIDATE, e estabelecer assim uma sólida base para orientar o desenvolvimento do Projeto Cyted RUN (Rios Urbanos Renaturalizados).

Sandrine Simon discute no capítulo **"Towards city resilience, food security and territorial learning. Three territorial paradigmatic shifts triggered by the COVID-19 pandemic"** a lógica e metodologia empregadas na sua investigação, que, centrada em Agricultura Urbana, está a analisar o potencial de um novo pensamento estratégico para assegurar um sistema alimentar mais sustentável em Lisboa. Sua conceção abrange agricultura sustentável e economia circular para facilitar o empoderamento dos cidadãos que dotados de 'soft skills' estarão mais bem capacitados a resolver os problemas locais – enriquecendo assim o conceito de Educação Territorial.

A terceira parte - **Ensaios** - contém uma visão dos temas em que os membros do CIDATE e do Conselho Consultivo Externo bem como autores convidados estão a trabalhar e sua contribuição para os estudos sócio-territoriais.:

O ensaio de **Sandrine Simon**, **Tiago Duarte**, **Sónia Vladimira Correia**, **Pedro Afonso Fernandes**, **Carlos Smaniotto Costa** e **Zuinder Manico** abre esta secção. Em **"The potential of citizens science for socio-spatial studies. Defining and operationalising research pathways"** os autores reúnem o resultado de debates organizados sobre o potencial da ciência cidadã como abordagem metodológica e fazem uma análise das experiências em projetos de investigação. O objetivo é delinear as questões-chave que possibilitam operacionalizar ciência cidadã nos futuros trabalhos de investigação e programas de intervenção do CIDATE.

Agnieszka Kruszwicka e **Michal Klichowski** no ensaio **"Escape from labs: How to expand the territory of brain research"** sugerem como trazer a investigação sobre o cérebro para fora dos laboratórios. O desenvolvimento de novas tecnologias digitais e móveis, segundo os autores, facilita a exploração de novos territórios nas suas propostas de investigação, trazendo-as para espaços (comuns) do quotidiano.

Mônica Bocci, em **"Social responsibility and underground heritage valorisation in small rural communities: Lessons from two Italian cases"**, debruça-se sobre dois casos de patrimônio subterrâneo para questionar como a responsabilidade social pode servir de orientação no envolvimento de comunidades e atores do turismo no desenvolvimento de uma abordagem mais sustentável para o turismo rural.

Marluci Menezes recorre a uma perspetiva da antropologia do espaço em **"A framework to grasp socio-territorial relationships: a conceptual path"** para abordar o caminhar como método de pesquisa para obter uma visão mais sensível dos aspetos sócio-territoriais que perpassam as relações quotidianas no espaço urbano.

Jacques Galhardo reflete em seu ensaio **"How daily life impacts social science"** sobre o conceito de cotidiano - uma relação entre tempo e espaço – para ampliar a maneira de entender gentrificação, fragmentação e segregação. Galhardo argumenta que um conflito de temporalidades – entre diferentes atores – poderia ser uma das possíveis razões.

Os editores, Carlos Smaniotto Costa e Nagayamma Aragão, agradecem a todos os colaboradores deste volume, por trabalharem suas questões com criatividade e rigor científico e por depositarem confiança na nossa liderança e competência editorial. Gostaríamos também de reconhecer o trabalho dos Consultores Externos que nos ajudaram na revisão por pares dos contributos garantindo integridade, rigor e excelência, e apoio aos jovens investigadores.

Esperamos que aprecie a leitura. Dê-nos a sua opinião sobre as questões e resultados discutidos nestes trabalhos.

Carlos Smaniotto Costa

Nagayamma Aragão

PARTE UM
NOVAS ABORDAGENS

PART ONE
NEW APPROACHES

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Uso de espaços verdes urbanos pelas pessoas idosas e sua perceção de saúde e qualidade de vida

Elderly people's use of urban greenspaces and perception of health and quality of life

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Resumo - *O presente capítulo visa apresentar o trabalho em curso no âmbito de um projeto de doutoramento em Urbanismo. O projeto tem como objetivo geral explorar a relação entre a perceção de qualidade de vida e bem-estar mental das pessoas idosas (com 65 ou mais anos) e a sua utilização de espaços públicos verdes em contexto urbano. Esta inter-relação entre saúde e ambiente natural não é inovadora e já em 1986, na conferência de Ottawa, se reconhece e destaca a sua importância ao incluí-la na agenda de saúde pública. O projeto aqui descrito está alicerçado, por um lado, na ideia de que a expansão urbana impacta nos cidadãos em várias dimensões e, portanto, exige que o urbanismo responda às suas necessidades e direitos. Por outro lado, as pessoas com 65 e mais anos são globalmente um grupo em crescimento e um dos mais vulneráveis às rápidas transformações decorrentes da contínua urbanização. Urge, então, encontrar respostas que permitam às pessoas que vivem e envelhecem em cidades usufruírem da longevidade, mas com qualidade de vida. Assim, no final do projeto espera-se poder fornecer algumas respostas às seguintes questões: o bem-estar mental e a qualidade de vida das pessoas idosas melhoram com o uso de espaços verdes urbanos e quais as características dos espaços que são mais importantes para esses utilizadores? A informação que conduzirá às respostas será extraída do questionário desenvolvido para o estudo I deste projeto (os diferentes estudos do projeto são apresentados na secção sobre metodologia deste capítulo), que, devido à emergência de saúde pública resultante do surto de SARS-CoV-2, não pôde ser aplicado nas datas inicialmente previstas. Adicionalmente, o questionário foi alterado no sentido de incluir questões que permitam também compreender o impacto percebido da situação pandémica no uso e frequência de espaços públicos, e na qualidade de vida e bem-estar mental percebidos.*

Palavras-chave - Espaço público verde, bem-estar mental, pessoas idosas, COVID-19

Abstract - *This chapter presents the work conducted within an ongoing PhD project in Urban Planning. The general goal is to explore the relationship between the perception of quality of life and mental well-being of older adults (aged 65 and over) and the use of public urban greenspaces. The project is based on a twofold idea: i) growing urbanization impacts citizens in several life dimensions, calling for urban planning interventions to respond to their needs, ii) people aged 65 and over are a growing demographic group and one of the most vulnerable to the rapid changes resulting from continued urbanization. Hence, there is an urgent need to find answers that enable people who live and grow old in cities to enjoy longevity, but with quality of life. Thus, it is expected that this project may provide some answers on the impact the use of urban greenspaces may have on the mental well-being and quality of life of older adults. Also, it aims at exploring which characteristics of those spaces are considered most relevant to this end.*

Keywords - Public greenspace, mental well-being, older adults, COVID-19

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INTRODUÇÃO

O presente trabalho alicerça-se em dois fenómenos de dimensão global enquadradores da reflexão mais alargada que se pretende conduzir: a) o envelhecimento da população e os vários desafios sociais que encerra, nomeadamente ao nível das respostas e dos cuidados de saúde que é necessário prestar a esta população; b) a crescente urbanização, que acarreta outro conjunto de desafios, tais como múltiplas formas de pobreza, crescentes desigualdades e degradação ambiental.

Estreitando o campo de observação, o que se pretende é olhar para a cidade, e em particular para os espaços públicos verdes que pelas suas características únicas, formam um contexto com potencial para a promoção da saúde (física e mental) dos cidadãos, e em particular das pessoas idosas que residem em contexto urbano. Espaço verde urbano será aqui entendido "como todo o terreno urbano coberto por vegetação de qualquer tipo" (WHO, 2017: 2), que pode ser público ou privado com diferentes tamanhos e funções e pode incluir espaços azuis, como lagoas, lagos ou ribeiros (WHO, 2017).

As cidades (cada vez mais densamente povoadas) podem por um lado, ser associadas ao aumento da prevalência de doenças (por exemplo, devido à baixa qualidade do ar; à luz artificial noturna, ao trânsito, etc.). Por outro lado, as cidades também podem ser vistas à luz da influência positiva que podem ter na saúde dos seus habitantes, por exemplo através do contacto (passivo/ativo) com o espaço verde urbano.

Globalmente a população está a envelhecer em praticamente todos os países do mundo nos quais se assiste a um aumento (absoluto e relativos) das pessoas com 65 e mais anos na sua população (UN, 2020). Face ao exposto, se as cidades estão envelhecidas e se a população idosa (com 65 e mais anos) tem maior probabilidade de ter problemas de saúde, este é um grupo que deve ser ouvido e considerado para melhor capitalizar os benefícios que podem ser retirados do acesso e uso de espaços públicos verdes em contextos urbanos. Contudo, o uso de espaços verdes e os benefícios a ele associados não dependem apenas da sua mera existência. Ou seja, os benefícios dos espaços públicos verdes na saúde não dependem apenas da quantidade de espaço público verde disponível, mas também da qualidade e dos atributos desse mesmo espaço verde que são percebidos pelos utilizadores ao estarem em contacto com esses elementos naturais (Wood et al., 2017; van den Berg et al., 2010). Pretende-se assim, explorar no trabalho de investigação em curso, como e por que mecanismos a quantidade e a qualidade de espaços públicos verdes em contexto urbano se interrelacionam com o bem-estar mental e qualidade de vida dos adultos idosos.

ENQUADRAMENTO TEÓRICO

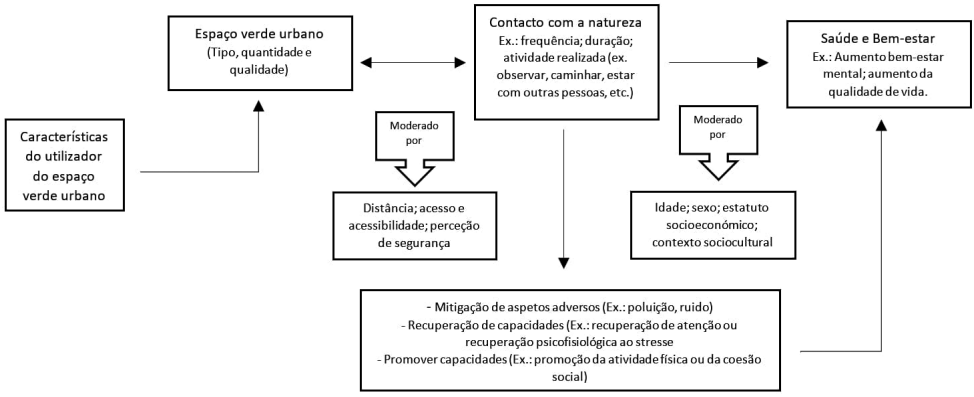
Urbanização e Saúde

A urbanização cresce a um ritmo acelerado sendo que em 2018 mais de metade da população mundial (55%) já residia em áreas urbanas enquanto as projeções indicam que já em 2050 este número atinja os 68% (UN, 2018). Torna-se, pois, fundamental que esses contextos urbanos sejam saudáveis e ofereçam um ambiente favorável a todos os cidadãos e às suas diversas necessidades e expectativas; que encorajem e promovam estilos de vida saudáveis para todos; e que ofereçam um ambiente construído que encoraje e promova a saúde, a recreação e o bem-estar (WHO, 2009). E nesse sentido assiste-se a uma tendência global dos decisores políticos olharem para o planeamento urbano como um instrumento de saúde pública, alargando o debate sobre o seu impacto na saúde e bem-estar da população. Destaca-se por exemplo as ideias preconizadas na Declaração de Quito de 2016 na qual se assume *"promover a inclusão e assegurar que todos os habitantes, das gerações presentes e futuras, sem discriminações de qualquer ordem, possam habitar e construir cidades e aglomerados urbanos justos, seguros, saudáveis, acessíveis, resilientes e sustentáveis e fomentar a prosperidade e a qualidade de vida para todos"* (UN-Habitat, 2016:5). Claro que o reconhecimento desta inter-relação entre ambiente urbano e saúde não é inovador e remonta às origens do urbanismo moderno. A criação da primeira lei de saúde pública pelo parlamento inglês em meados do século XIX marca um momento assinável através da qual se olha a criação de espaços urbanos como meio para a melhoria da salubridade nas cidades. E resultante desta relação alicerçada nos grandes avanços da medicina as condições de vida dos cidadãos urbanos começam a melhorar e várias doenças transmissíveis começam a ser erradicadas.

A inter-relação entre saúde e ambiente natural foi já renovada e destacada pela sua importância em 1986 na conferência de Ottawa e tem-se refletido quer ao nível das políticas públicas quer ao nível da literatura científica, consolidando-se o argumento que o ambiente é um determinante da saúde e do bem-estar que deve ser considerado (Lalonde, 1981; Wilkinson & Marmot, 2003). Neste trabalho, procura abordar-se esta relação, explorando o contributo dos espaços verdes urbanos para a saúde e o bem-estar. A concetualização de espaço verde público urbano, tal como é entendido hoje, surge já a partir do século XVIII. Contudo, é precisamente no século seguinte, decorrente da necessidade de corrigir as más condições de salubridade resultantes da Revolução Industrial que se altera a relação entre natureza e o ambiente urbano e emerge o conceito de espaço verde urbano como solução para melhoria do ambiente urbano (Magalhães, 1992). E assim, a natureza passa a ser procurada e desejada e não um espaço desconhecido e com vários perigos, separado e distante da cidade (van den Berg et al., 2007). A presença de natureza na cidade, transformou-se aliás no curso do último século e meio, de um refúgio separado da cidade, marcado pela dicotomia e distinção espacial entre ambos,

para ser entendida como uma componente essencial da mesma. Os espaços verdes marcam a paisagem urbana e são reconhecidos como sua parte integrante, na qual desempenham funções essenciais com benefícios múltiplos (Duvall et al., 2017).

As publicações académicas (quer teóricas quer empíricas) sobre saúde e espaço verde aumentaram nas últimas décadas por razões diversas. Por um lado, a definição proposta pela OMS (1946) que preconiza que *"a saúde é um estado de completo bem-estar físico, mental e social, e não consiste apenas na ausência de doença ou de enfermidade"* vem refletir a natureza subjetiva e multidimensional do conceito permitindo que a sua compreensão e promoção não se limite aos profissionais da área da saúde, abrindo um campo de reflexão e intervenção para diferentes áreas do conhecimento. Por outro lado, as alterações decorrentes da crescente urbanização e a adoção de estilos de vida menos saudáveis (associados a doenças cardíacas, doenças oncológicas, obesidade, diabetes, osteoporose, doenças mentais, etc.) reduzem as possibilidades de contacto com a natureza e dos benefícios que resultam desse contato (De Vries et al. 2003; Groeneweggen et al. 2006; Maas et al. 2006; Mitchell & Popham, 2007; Sugiyama et al. 2008; Takano et al. 2002; Hartig et al. 2014; van den Berg et al. 2015; Gascon et al. 2015). A relação entre o contacto com a natureza e a saúde tem sido explicada através de diferentes vias e é no cruzamento destas vias que o trabalho de doutoramento em causa pretende obter algumas respostas (ver quadro 1).



Quadro 1. Relação entre espaço verde urbano e saúde
Fonte: Adaptado de Hartig et al., 2014: 2013.

ENVELHECIMENTO E ESPAÇO VERDE URBANO

Residir em áreas urbanas densamente habitadas que oferecem espaços verdes para caminhar parece ter uma influência positiva na longevidade de pessoas idosas, independentemente da idade, sexo, estado civil, grau de funcionalidade e nível socioeconómico (Takano et al., 2002). Este facto tem particular relevância ao considerar-se as transformações demográficas associadas ao duplo fenómeno do

envelhecimento (com a redução da taxa de natalidade e aumento da longevidade). Ou seja, quase todos os países do mundo estão a envelhecer, e pela primeira vez na nossa história, em 2018 o número de pessoas com 65 ou mais anos era superior ao número de crianças com menos de cinco anos (UN, 2019). As projeções apontam para um agravamento deste fenómeno. E espera-se que em 2050 o número de pessoas com mais de 65 anos (1.5 biliões) seja mais do dobro do que crianças com menos de cinco anos, ultrapassando também o número de jovens e adolescentes entre os 15-24 anos (1.3 biliões) (UN, 2019).

E se por um lado, o aumento da longevidade assinala a grande evolução da ciência, e uma grande conquista da humanidade, por outro acarreta um conjunto de desafios, como sejam os custos económico-financeiros associados ao declínio na saúde e às necessárias respostas ao nível dos cuidados a prestar a esta população, para os quais faltam ainda muitas respostas. Ou seja, não basta que a longevidade aumente, é necessário que ocorra com saúde e qualidade de vida. Assim, pode relembrar-se a estratégia da Organização Mundial da Saúde (OMS) "saúde em todas as políticas" (OMS, 2010) que recomenda o envolvimento de diferentes setores, como por exemplo da gestão do território, da agricultura, do ambiente e sustentabilidade e destaca a importância de avaliar os impactos das diferentes políticas sectoriais na saúde. E é a população com 65 anos ou mais anos aquela que apresenta maior probabilidade de manifestar problemas de saúde, logo deve ser um grupo demográfico a considerar quando se reflete sobre os benefícios que se podem obter com o acesso e uso de espaços verdes públicos urbanos. Com a diminuição da mobilidade das pessoas com 65 e mais anos a fruição de diversos espaços na cidade pode ficar condicionada devido a certas características ambientais (Shumway-Cook et al., 2003). E neste contexto de envelhecimento, mesmo quando associado a algum declínio na funcionalidade e/ou na independência, existe um sentido de pertença a uma comunidade da qual se quer continuar a fazer parte. E são muitos os idosos que querem envelhecer na sua comunidade. Este desejo traduz-se na ideia do ageing in place, que mais não é do que garantir oportunidades para que a população mais idosa possa permanecer incluída e integrada na comunidade à qual pertence, com independência e segurança (Fonseca, 2018).

Se devido a um comprometimento ao nível da saúde as pessoas idosas podem apresentar maior dificuldade no acesso a espaços verdes distantes da sua área de residência, estão, portanto, mais dependentes da existência desses mesmo espaços na sua proximidade. O trabalho de Maas et al. (2006) conclui que deve ser tida em consideração a quantidade de espaços verdes no ambiente residencial urbano na tentativa de melhorar a condição de saúde dos idosos, dos jovens e de grupos socioeconomicamente desfavorecidos. O mesmo trabalho demonstra que a perceção global da saúde é mais positiva para quem reside em áreas mais verdes. Apenas 10,2% dos 250782 participantes no estudo reportam pior auto-perceção do estado de saúde quando 90% do ambiente na proximidade da sua residência é composto

por área verde. Quando apenas 10% da área circundante é verde 15,5% dos moradores reportam pior saúde percebida. Sendo esta relação igualmente forte quando se alarga a análise para um raio de 1km ou 3 km. Destaca-se ainda que esta relação é ainda mais significativa para quem tem níveis de escolaridade mais baixos, para jovens e para idosos (sendo esta última relação particularmente mais significativa para espaço verde no raio de 1km).

METODOLOGIA

O projeto do qual o presente capítulo deriva consiste em três estudos: dois de natureza quantitativa e um de natureza qualitativa. O projeto foi submetido a uma Comissão de Ética e Deontologia para a Investigação Científica da EPCV-ULHT (CEDIC) e aprovado com um parecer Favorável.

Os estudos II e III, ainda em desenvolvimento, não serão explorados no presente trabalho. Estes compreendem, respetivamente, a realização de entrevistas semi-estruturadas a participantes do estudo I e de um breve questionário a profissionais da área do urbanismo.

O estudo I, de natureza quantitativa, consiste na aplicação de um inquérito por questionário desenvolvido para o efeito e inicialmente seria para aplicar a residentes de Lisboa com 65 ou mais anos nos espaços públicos que frequentam.

Este estudo estava calendarizado para ter início em abril de 2020 com o pré teste do questionário, mas, devido à pandemia causada pela doença COVID-19 foi forçosamente interrompido. Face a este cenário e à imprevisibilidade do mesmo foi necessário repensar todo o processo de investigação. O acesso aos espaços públicos foi proibido com o decretar do estado de emergência; a população idosa sendo a mais vulnerável a doença grave e com maior mortalidade associada foi aconselhada a proteger-se; as universidades e centros de investigação fecharam.

Face a este cenário, colocaram-se vários desafios à investigação: como continuar com o projeto? E pode o projeto continuar sem recolha de dados face a face? Um aspeto central da metodologia que estava definida seria que a aplicação do questionário seria realizada presencialmente, nos espaços públicos que as pessoas idosas frequentam. Não sendo possível escolheu-se aplicar o questionário remotamente, convertendo-o para uma plataforma digital de recolha de dados (LimeSurvey©) e recorrer a diversas entidades (associações, ginásios, universidades seniores, etc.) para divulgarem o projeto, recrutarem potenciais participantes e partilhar a informação de contato daqueles que aceitem participar. Estas entidades estiveram largos meses encerradas, quando reabriram não tinham disponibilidade porque ainda era grande a incerteza face à forma como podiam reorganizar os serviços que prestavam. Em meados de 2021 começou finalmente a sentir-se alguma abertura e as primeiras respostas positivas começaram a chegar.

Contudo a aplicação remota do questionário acarreta também algumas dificuldades.

Sem fazer generalizações idadistas, a verdade é que há ainda hoje um grande número de pessoas com 65 e mais anos com uma literacia digital significativamente baixa. Implica, portanto, que em muitos casos não bastará enviar a hiperligação do questionário e esperar pelo preenchimento do mesmo, logo, terá de ser feito pelo entrevistador via telefone ou via plataforma de videoconferência. Neste último caso, o desafio anteriormente apresentado também se fará sentir. Ou seja, a expectativa é que a maior parte dos dados a recolher (e estabeleceu-se inicialmente um mínimo de 250) seja efetuada via telefone pelo entrevistador.

O questionário a aplicar também teve de ser alterado e ajustado ao contexto pandémico. As seis secções definidas inicialmente permanecem, mas foi necessário introduzir novas questões sobre o impacto da COVID-19 no uso dos espaços públicos e sobre a alteração da perceção da qualidade de vida e bem-estar mental antes e durante a situação pandémica. As seis secções iniciais visam recolher informação sobre:

i) Dados sociodemográficos (p. ex. a idade, sexo, composição do agregado familiar, área de residência, ocupação profissional);

ii) Tipo de uso e frequência de uso de Espaços Públicos Verdes (p. ex. espaço verde mais usado, a que distância fica de casa, quantas vezes é usado e por quanto tempo, quando e com quem se usa e o que atividades são realizadas no espaço verde);

iii) Qualidade de vida (escolheu-se a versão portuguesa do EUROHIS-QOL-8. É um instrumento com boas características psicométricas, que permite uma avaliação fácil, breve e válida, dos quatro domínios da qualidade de vida (físico, psicológico, relações sociais e ambiente), sendo mais facilmente incluída no questionário e adequada à população em estudo (Power, 2003; Schmidt et al., 2006; Pereira et al., 2011);

iv) Bem-Estar Mental (medido pela versão portuguesa da Warwick-Edinburgh Mental Well-Being Scale – WEMWBS que mede a saúde mental positiva e o bem-estar, integrando elementos hedónicos (felicidade, satisfação com a vida) e eudaimónicos (funcionamento positivo) do bem-estar. Apresenta boas qualidades psicométricas e é aplicável a diferentes culturas (Tennant et al., 2007; López et al., 2012; Taggart et al., 2013);

v) Capacidade recuperadora do ambiente (avaliada pela PRS-11 (Pasini et al., 2014). A versão reduzida de 11 itens revela-se útil no presente trabalho, pela simplificação da aplicação e porque permite ultrapassar as preocupações com as qualidades psicométricas da versão original da escala. A escala baseia-se na Teoria da Recuperação da Atenção (Kaplan, 1995), que preconiza que a exposição a ambientes naturais ajuda na recuperação da fadiga atencional (Berto, 2005; Kaplan, 1995), através do contributo de quatro componentes presentes no ambiente: afastamento, fascínio, extensão (resultado de alcance e coerência) e compatibilidade (Kaplan, 1995). Pasini et al., 2014 propõem que um modelo de quatro fatores para

avaliar a capacidade recuperadora do ambiente (Afastamento, Fascínio, Coerência e Alcance) é o que oferece uma visão mais completa da capacidade recuperadora e estabelecem ainda que a PRS de 11 itens também se revela invariável relativamente à nacionalidade e ao género (Pasini et al., 2014);

vi) Perceção sensorial do ambiente (foi avaliada através das oito dimensões sensoriais percebidas (PSD)[1]: natureza, cultura, panorama, social, espaço, rico em espécies, refúgio e sereno (Grahn & Stigsdotter, 2010). Estas dimensões descrevem mais as qualidades estéticas e não tanto características físicas do espaço verde (Roth & Gruehn, 2012) que parecem ser percebidas e interpretadas de modo semelhante em diferentes contextos culturais (Skärbäck et al., 2015). Algumas das qualidades que caracterizam as PSD não podem representar espaços verdes urbanos de menor dimensão, objeto de análise no presente estudo (por exemplo, a presença de áreas não cruzadas por caminhos ou campos de futebol). Assim, decidiu-se incluir neste trabalho as qualidades que foram consideradas mais adequadas e com relevância para avaliação do contexto de jardins urbanos (Peschardt & Stigsdotter, 2013), resultando em 24 itens. Ou seja, foram selecionadas três variáveis em cada uma das oito dimensões. Cada variável é medida através da avaliação dos utilizadores usando uma escala de likert de cinco pontos de "discordo totalmente" a "concordo totalmente".

vii) Secção final do questionário informa sobre o estudo II e convida à participação no mesmo.

RESULTADOS ESPERADOS

Como referido anteriormente, o espaço público verde de proximidade é um recurso fundamental para os habitantes urbanos, mais ainda para quem, por razões etárias, de dificuldade na mobilidade ou dificuldade de acesso a transporte, tem menos independência para explorar áreas mais distantes da zona de residência. Esta realidade enfatiza a relevância da necessidade de se olhar para os espaços públicos e em particular para os espaços públicos verdes como contextos de intervenção na área da saúde. A relação entre a natureza e a cidade não é nova para o urbanismo (e que foi de certo modo reavivada e tornada mais visível pela situação pandémica que hoje se vive), que deve, portanto, intervir nos territórios tendo em vista as diferentes vias para a saúde e benefícios para a saúde que decorrem dos espaços urbanos verdes (Egorov et al., 2016).

O projeto visa analisar a forma como certos espaços verdes urbanos podem ter capacidades recuperadoras e contribuir para a saúde dos habitantes (com 65 e mais

[1] Natureza (experiência de sensação da força e poder inerentes à natureza), cultura (sensação de ambientes moldados pela história e/ou cultura), panorama (sensação de vista aberta e plana), social (sensação de um ambiente equipado para atividades e interações sociais), espaço (ambiente é percebido como espaçoso e livre, mas sem muitos caminhos que o dividam), rico em espécies (sensação de encontrar uma ampla variedade de plantas e animais), refúgio (sensação de um ambiente fechado e seguro) e sereno (sensação de estar num ambiente imperturbável, calmo) (Grahn & Stigsdotter 2010).

anos) da cidade e pretende-se ainda que estes resultados possam ser divulgados e considerados, pelos técnicos de saúde, pelos urbanistas e outros especialistas envolvidos nos modos de pensar e construir a cidade. Pretende-se, portanto, apresentar uma descrição dos resultados que permita a comunicação e diálogo transdisciplinar e em última instância que a importância de espaços verdes públicos na saúde continue a ganhar relevância. Para tal, os seguintes objetivos específicos serão operacionalizados:

i) Estabelecer predições sobre as qualidades do espaço verde urbano (PSD) que se associam a determinados benefícios de bem-estar mental nos idosos (WEMWBS) e qualidade de vida (EUROHIS-QOL-8);

ii) Compreender se as dimensões sensoriais percebidas (PSD) no espaço urbano verde se associam com a perceção da capacidade recuperadora desse espaço (PRS-11);

iii) Aferir se a associação entre as dimensões sensoriais percebidas (PSD) e a capacidade recuperadora percebida do espaço verde (PRS-11) é diferente para quem reporta maior e menor bem-estar mental (WEMWBS).

iv) Aprofundar o estudo dessas associações através do estudo II (de natureza qualitativa).

v) Compreender se as dimensões sensoriais percebidas (PSD) no espaço urbano verde urbano são avaliadas pelos utilizadores leigos idosos e por especialistas na área do desenho/planeamento de forma distinta (estudo III).

REFLEXÕES FINAIS

Por razões de um maior comprometimento ao nível da saúde as pessoas mais velhas podem ser confrontadas com maiores dificuldades no acesso a espaços naturais distantes da sua área de residência/bairro, estando por isso mais dependentes dos espaços públicos verdes existentes perto de si. É, pois, fundamental reconhecer que o processo de envelhecimento e as mudanças que ocorrem nessa fase do ciclo de vida podem trazer desafios aos quais as pessoas idosas se têm de adaptar.

Neste contexto a importância da proximidade, acessibilidade e o desenho de espaços verdes urbanos que beneficiem a saúde dos utilizadores com 65 e mais anos exige mais conhecimento. Em particular, é importante tentar conhecer e compreender as qualidades dos espaços urbanos verdes que melhor podem contribuir para a saúde e a qualidade de vida desta população. Com esse saber aplicado e encorajando as pessoas idosas a usar os espaços públicos verdes poder-se-á capitalizar o potencial salutogénico de tais espaços.

Por fim, a par das diferentes questões, problemas e desigualdades que a situação pandémica causada pela COVID-19 fez emergir e destacar, surge, por um lado, a importância da qualidade do meio urbano na saúde e na vida nas cidades, e por outro lado, surgem as dificuldades ao nível da restruturação do meio académico e científi-

fico. Estas mudanças podem ter carácter temporário, contudo todas as escolhas e decisões para lhes dar resposta poderão ser (ou não) transformadoras (de forma positiva e/ou negativa) do nosso futuro enquanto cidadãos e enquanto investigadores. Para já, resta apenas fazê-las e mais tarde refletir sobre elas.

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Da crise financeira e económica à crise sanitária. Impactos no sector imobiliário e os seus efeitos no território nacional

From the financial and economic crisis to the health crisis. Impacts on the real estate industry and its effects on the national territory

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Resumo - *Para além de um olhar sobre a forma e o modo como a alteração da conjuntura económica e financeira provocada pela crise do subprime e pelas medidas de austeridade condicionaram e alteraram a atividade construtiva e imobiliária e se fazem sentir no território nacional, procurou-se também dar uma perspetiva da realidade mais recente, e situar essa abordagem num cenário onde se inter-relacionam novas dimensões importantes da conjuntura económica – recuperação do investimento estrangeiro e melhoria dos indicadores macroeconómicos. Porém, torna-se evidente que a crise sanitária vem abalar o quadro de retoma económica observada nos anos mais recentes, levando-nos a questionar qual o efeito dessa situação na dinâmica do sector.*

Palavras-chave - Crise financeira, mercado subprime, política de austeridade, instrumentos estatais e crise sanitária

Abstract - *This chapter provides an analysis of changes in the economic and financial situation caused by the subprime crisis and the subsequent national austerity measures, and how these conditioned the construction and real estate sectors. It also gives a better overview of more recent events in order to reflect a scenario where the interrelations between new important dimensions of the economic conjuncture are considered, such as the recovery of foreign investment and the improvement of macroeconomic indicators. The health crisis is shaking the economic recovery of recent years, leading us to question the effect of this on the dynamics of the construction and real estate sectors.*

Keywords - Financial crisis, subprime market, austerity policy, state instruments and health crisis

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INTRODUÇÃO

No seguimento do projeto de investigação recentemente concluído e denominado: "O Impacto da Política de Austeridade no Sector Imobiliário e os Seus Efeitos no Território Urbano da Área Metropolitana de Lisboa" pretende-se apresentar neste capítulo alguns resultados e algumas reflexões sobre o trabalho desenvolvido, dando particular enfoque ao modo como um problema despoletado pelo mercado subprime da habitação nos Estados Unidos da América (EUA), desencadeou uma forte contração da disponibilidade de crédito ao nível global, e deu início a um período recessivo com repercussões mundiais que foi particularmente acutilante nos países com economias mais frágeis. E enfatizando ainda, a forma e o modo como a crise global de 2007/08 e as medidas associadas ao Programa de Austeridade e de Ajustamento Financeiro e Económico, impostas no território nacional, a partir de 2011, podem condicionar ou influenciar as condições de vida, as dinâmicas construtivas e imobiliárias registadas no país, em geral, e na Área Metropolitana de Lisboa (AML), em particular.

Simultaneamente, atendendo ao atual contexto pandémico a nível global considerou-se oportuno e relevante apresentar também algumas reflexões sobre o modo e a forma como a atual crise sanitária pode alterar, ou potenciar, as dinâmicas construtivas e imobiliárias que prevalecerem no território nacional nos últimos anos, particularmente no período pós-Programa de Assistência Financeira. De facto, para além do forte contexto de incerteza, esta "nova" crise vem impor a todas as sociedades, a adopção rápida de novos procedimentos, bem como suscitar novos desafios à *perfomance* da economia, em geral, e do sistema de saúde, em particular.

A CRISE FINANCEIRA E A POLÍTICA DE AUSTERIDADE

A crise financeira mundial (2007/08) iniciada no mercado *subprime* da habitação dos Estados Unidos da América (EUA) desencadeou uma forte contração da disponibilidade de crédito a nível global, dando início a um período recessivo com repercussões mundiais. O impacto desta situação na Europa foi devastador, na medida em que a conjugação entre o congelamento do crédito e a contração da procura internacional[1], iniciada na década anterior, provocam recessão nos países com economias mais frágeis.

Efetivamente, esta crise surge não apenas como uma disfunção do sistema financeiro, mas igualmente como uma consequência da lógica no desenvolvimento do modo de produção capitalista que beneficiou de um clima economicamente favorável ao crescimento do mercado imobiliário, com particular intensidade nos EUA, a partir de 2002. Compactuando com a expansão do mercado de empréstimos

[1] Situação que perdurava desde a década anterior como consequência do aumento da concorrência das economias da Europa de Leste e da Asia Oriental e da inexistência de mecanismos para fazer face à concorrência acrescida, resultando na acumulação de excedentes, nos países da Europa Central.

imobiliários de elevado risco, de maior rentabilidade, em detrimento do tradicional que não garantia retornos tão altos. Na verdade, o aumento dos preços dos imóveis, resultante em grande medida de alterações conjunturais na economia e de uma perspetiva financeira de encarar o mercado imobiliário residencial, associado a uma maior permissividade do sistema financeiro, possibilitou a ampliação do crédito ao consumidor e a perceção, embora virtual ou fictícia, de que as sociedades estavam perante um ambiente marcado pelo otimismo e pela euforia económica. Na perspetiva de Kurz (2007), os preços ascendentes do imobiliário registados nos primeiros anos do século XXI, resultantes de uma procura inflacionada, fizeram deste sector um compensador campo de especulação quando os mercados acionistas se afundaram nos EUA, na passagem do milénio, contribuindo para uma transferência assinalável de recursos e poupanças para o investimento imobiliário, não só através de transações imobiliárias (compra/venda), mas também via aquisição de papéis especulativos, *comummente* designados por títulos de empréstimos.

De acordo com a pesquisa bibliográfica realizada sobre este assunto, a crise financeira encontra a sua origem na crescente fragilidade das estruturas financeiras, revelando uma lógica de funcionamento do sistema financeiro contemporâneo assente em novos, complexos e opacos produtos financeiros, como os empréstimos *subprime*[1] e a securitização do crédito[2], que ao reforçar a «financeirização»[3] da economia, viriam a revelar-se operações de elevado risco mas, concedendo, contudo, um novo impulso à atuação capitalista, garantindo uma maior liquidez para posteriormente ser canalizado para o sector imobiliário residencial, infraestruturas e operações de desenvolvimento urbano (Kurz, 2007; Harvey, 2010; 2012).

A desaceleração do mercado imobiliário norte-americano, a partir de 2005/6, decorrente do aumento das taxas de juro, provoca uma queda do valor imobiliário residencial e faz emergir problemas inerentes aos produtos financeiros de maior risco, pelo facto dos seus titulares contarem com a possibilidade de refinanciar as suas hipotecas com taxas de juro mais baixas, hipótese mais difícil de concretizar com o novo quadro económico. Situação económica que acentuou a queda do preço do imobiliário residencial, provocando o excessivo endividamento dos respetivos titulares, despoletando a insolvência e a entrega de muitos imóveis às entidades financiadoras.

[1] Empréstimos que permitem a expansão do crédito a famílias de baixos rendimentos (subprime), com um risco de incumprimento elevado.

[2] A securitização de crédito consiste no "desconto" de pacotes de dívidas não vencidas transformando-as em títulos negociáveis e consequentemente, em liquidez para quem vende. Por exemplo, os bancos podem vender uma carteira de crédito vivo sobre os seus clientes e obter fundos junto de outro ou outros bancos. Esses fundos servirão por sua vez para financiar mais crédito. Esta atividade de securitização tem um custo para quem "vende" o crédito, sendo esta compra prática muito comum de alguns bancos (como são ex.: bancos de investimento, bancos que gerem grandes fundos). Na Europa esta prática é desde sempre muito controlada, normalmente limitando os compradores aos bancos centrais, existindo limites rígidos para os montantes que cada banco pode "descontar".

[3] Designação atribuída por Harvey (2010) às operações financeiras, implementadas a partir da década de 70, para disponibilizar às sociedades e aos mercados maior liquidez.

A rápida disseminação deste problema de natureza exclusivamente financeira para outros países, deve-se fundamentalmente ao facto de muitos bancos internacionai estarem diretamente envolvidos no processo e terem aumentado a sua participação nas hipotecas *subprime*. Na perspetiva de Martin (2011), esta crise constitui um bom exemplo de um processo de globalização que ao fomentar a integração financeira global contribui, de forma significativa, para que um problema circunscrito a um local assuma um impacto global. De facto, a globalização ao suscitar novas relações e funções em espaços geográficos distintos, deslocalizando os circuitos financeiros locais para conectá-los globalmente em centros financeiros internacionais – como é caso de Londres e Nova Iorque - faz com que o sistema financeiro local se torne claramente dependente do comportamento e das decisões dos atores e das administrações financeiras dessas praças financeiras globais. E o facto de não existirem regulamentações financeiras globais suficientemente fortes para mitigar os riscos contribuiu para a sua rápida disseminação, passando o risco de um ativo para outros, e levando ao desgaste dos padrões de empréstimos (Donald e Gray (2014). Efetivamente, esta metamorfose do capitalismo sustentada pela fraca regulação, por parte do Estado, contribuirá, com o eclodir da crise, para expor o forte endividamento de algumas economias, suscitando a necessidade de resgaste financeiro, como foi o caso da Irlanda, da Grécia e de Portugal, e deixando outras reféns de fortes medidas de austeridade, como se verificou em Espanha e na Itália.

Ao longo da investigação confirmou-se que foram os países do sul da Europa os mais afetados, facto que não está diretamente relacionado com os procedimentos de regulação do sistema financeiro desses países, mas fundamentalmente, pelas dificuldades estruturais desses países no processo de ajustamento aos novos desafios da concorrência global, consequente agravamento das contas nacionais, aumento do défice das trocas comerciais e crescente peso dos juros da divida externa. Com a crise financeira este cenário económico agravou o défice público[1] desses países, na medida em que a desconfiança dos mercados em relação às suas capacidades de endividamento provocou o agravamento das taxas de juro e, consequentemente, grandes dificuldades no acesso ao crédito. Decorrendo destes factos, a necessidade de ajuda internacional, e a imposição, por parte das instituições envolvidas no processo (FMI, BCE e Comissão Europeia), de um Programa de Austeridade e de Ajustamento Financeiro e Económico, implementado nos últimos anos, nalguns desses países, condicionando grandemente a política económica e fiscal nacionais, o mercado de trabalho e o papel do Estado na sociedade.

Na verdade, o impacto da crise financeira e das políticas de austeridade na sociedade foi intenso e teve consequências a vários níveis – económico, financeiro, social e urbanístico. Em grandes traços, ao nível da vertente económica, manifestando-se essencialmente por uma acentuada retração económica e pela dificuldade das pequenas e médias empresas sobreviverem a um clima económico adverso ao

[1] Infringindo os 3% de limite do défice, estabelecido pelo Tratado de Maastricht.

consumo e ao investimento. Ao nível do sistema financeiro, pela enorme carência de liquidez e consequente dificuldade de financiamento da economia. Refletindo-se em termos sociais pelo aumento da taxa de desemprego, pela diminuição dos direitos dos trabalhadores e pensionistas, pela diminuição do rendimento disponível decorrente do aumento da carga fiscal, e pelo aumento da pobreza e das desigualdades sociais. E em termos urbanísticos, assumindo deliberadamente cortes no investimento público e restrições orçamentais para a atuação e gestão do espaço urbano, dificultando a prossecução de projetos de desenvolvimento territorial (Quadro1). Neste âmbito, e conforme argumenta Stiglitz (2014), a crise associada às medidas de austeridade, vem condicionar diretamente o investimento do Estado na oferta urbana[2], acentuando ainda mais as desigualdades no acesso a determinados bens e serviços.

	CRISE FINANCEIRA	POLÍTICAS DE AUSTERIDADE
Fatores Transversais	Risco sistémico da Crise do *Subprime*	Cortes no investimento público
	Menor concessão de crédito Aumento da fragilidade das estruturas financeiras	Aumento de impostos Diminuição de rendimento
Impacto Económico	Redução do financiamento da economia dos países Condicionalismos ao desenvolvimento dos países Alteração na atividade do sector da construção e dos mercados imobiliários	Contração do consumo de bens e serviços Diminuição das transações imobiliárias
Impacto Social	Aumento da migração de trabalhadores Redução do trabalho no sector da construção Polaridade da população ativa	Diminuição dos direitos dos trabalhadores e dos pensionistas Aumento do desemprego Aumento do nível de pobreza e das desigualdades sociais
Impacto Urbano	Condicionalismos à sustentabilidade das finanças públicas locais	Maiores restrições orçamentais para o investimento local e para o apoio social Aumento da segmentação social e espacial dos territórios urbanos

Quadro 1: Impacto da Crise Económico-Financeira e Principais Políticas de Austeridade adotadas
Fonte: Adaptado de Vale, Mário, Seminar "Nation –States Crises, Austerity and Cities Transformation in Europe", Lisboa, fevereiro de 2014

[2] Expressa pelos equipamentos de utilização coletiva (escolas, hospitais, bibliotecas), pelas infraestruturas e por outros serviços de apoio à população.

É neste cenário de crise global onde imperam medidas de austeridades que ganha relevo a perda de emprego e o aumento do número de desempregados que não só representam os impactos negativos mais imediatos como surgem de uma forma disseminada pelo território geográfico europeu. Existe aqui um reconhecimento de que a taxa média de desemprego da UE (28) aumentou significativamente de 2006 para 2014, representando respetivamente 8,2% e 10,2%. Um olhar mais atento a esta realidade dá-nos conta de que em 2014 as taxas de desemprego mais elevadas registam-se na Grécia (26,5%), em Espanha (24,5%), na Croácia (17,3%), no Chipre (16,1%) e em Portugal (14,1%) (Figura 1).

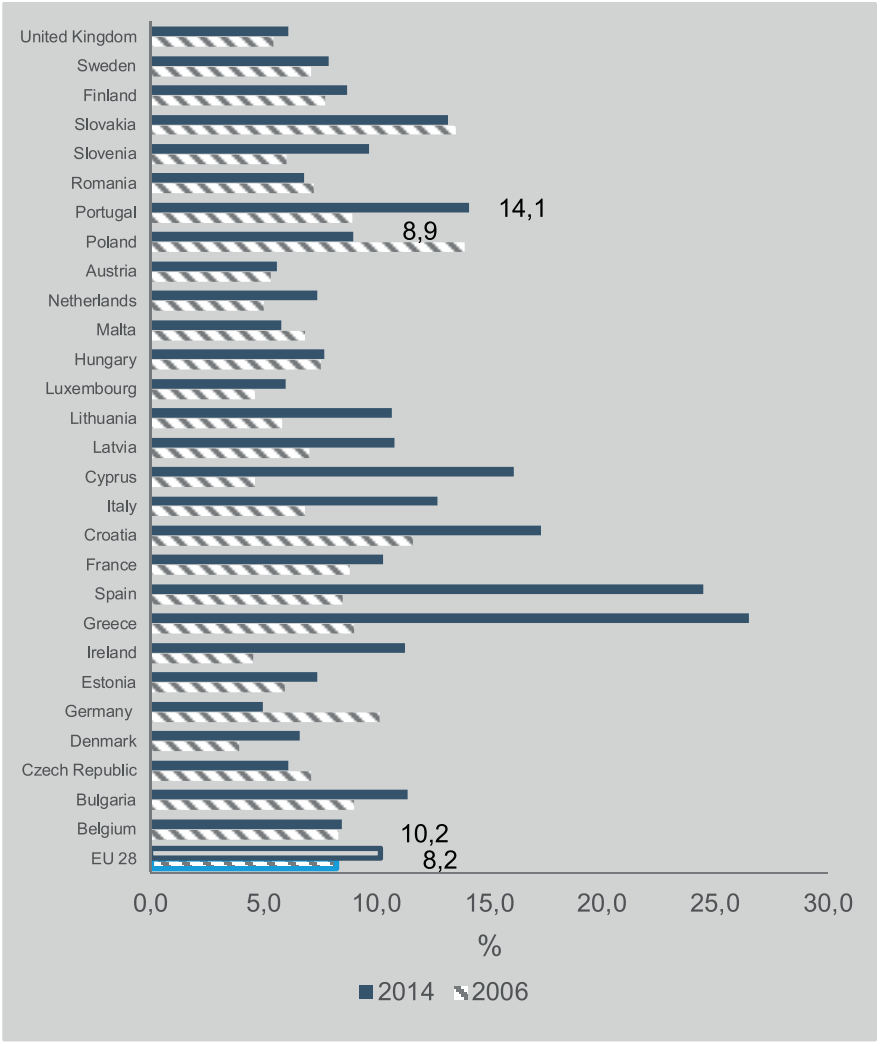

Figura 1: Taxa de Desemprego. Fonte: Elaboração própria, EUROSTAT, fevereiro 2016

Neste ponto importa ainda sublinhar que o desemprego pós-crise financeira afetou fundamentalmente os sectores de atividade ligados à indústria transformadora e

ao sector da construção, correspondendo aproximadamente a 40% e a 25% do desemprego total da UE (URBACTII, 2010), realidade que é manifestamente mais penalizadora nos Estados-membros cuja atividade económica se encontra muito dependente destes sectores de atividade, como é o caso da Irlanda, da Grécia, da Letónia, de Espanha e de Portugal, na medida em que a regressão do ciclo imobiliário causada, sobretudo, pela crise económica ao diminuir drasticamente a dinâmica e o emprego no sector, contribui também para reduzir as oportunidades de emprego para os desempregados provenientes desse sector de atividade (Figura 2).

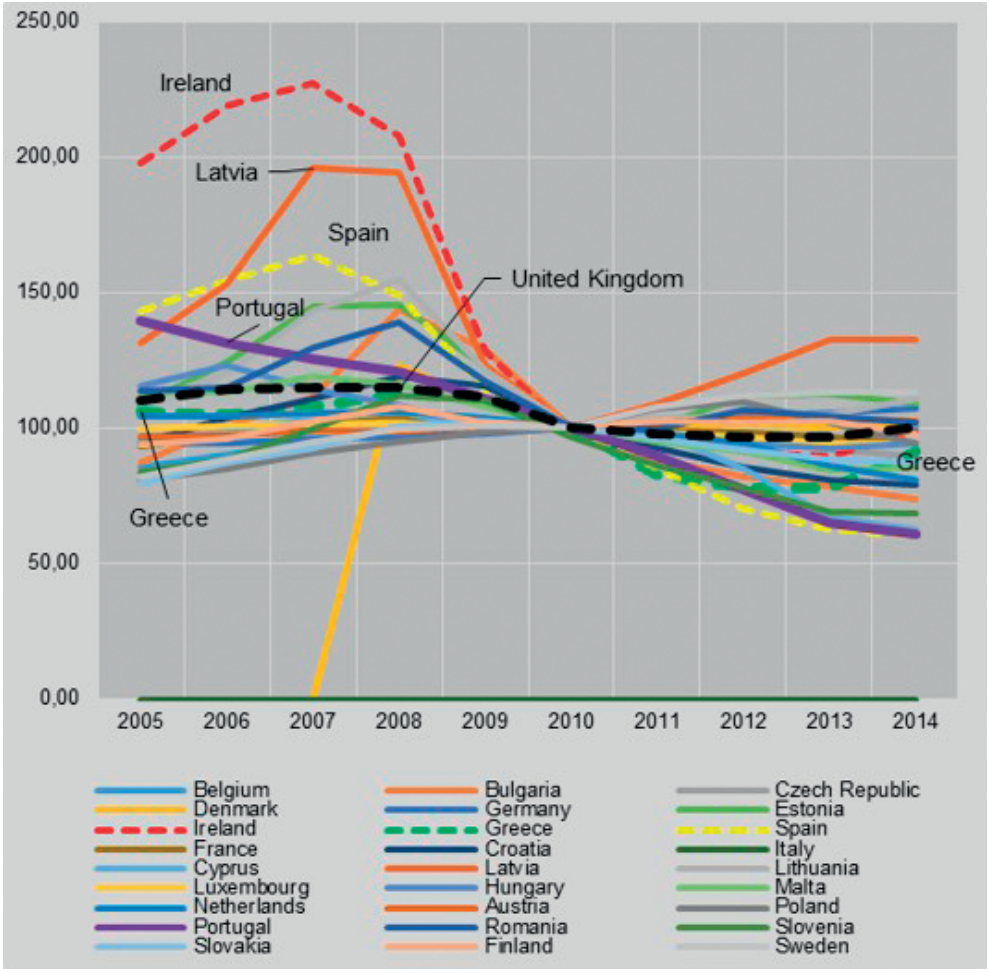

Figura 2: Entrada de Mão-de-obra para o Sector da Construção (2010 =100) 2005-2014.
Fonte: Elaboração própria, EUROSTAT, fevereiro 2016

E confirmando que o impacto da crise financeira na quebra do valor do imobiliário é uma situação transversal a quase todos os Estados-membros (excetuando Finlândia e Suécia), não obstante, é claramente mais acentuada na Letónia, na Estónia, na Lituânia, na Bulgária e na Irlanda, em 2009. Pelo contrário, nos anos seguintes,

fundamentalmente entre 2011 e 2012, a redução do valor do imobiliário residencial assume maior relevância, embora não dispondo de informação para a Grécia[1], nos Estados-membros que apresentam um elevado nível de endividamento público e particular, e apresentam uma maior distorção do peso da construção no total da economia como é, sobretudo, o caso da Irlanda, de Espanha e também de Portugal (Figura 3).

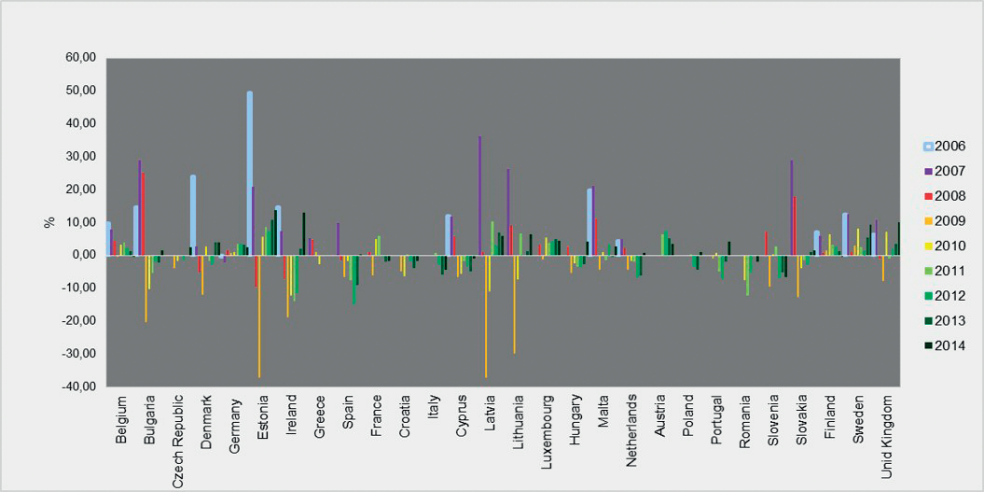

Figura 3: Índices de Preços de Habitação - Taxa de Variação Média Anual (2010=100), entre 2006 e 2014.
Fonte: Elaboração própria, EUROSTAT, janeiro 2016

O IMPACTO DA CRISE E DA POLíTICA DE AUSTERIDADE NO SECTOR IMOBILIÁRIO NACIONAL

E no contexto do território nacional o que se alterou com a crise financeira e económica? Quais os impactos espaciais dessas alterações? Estas são algumas das questões centrais que foram analisadas na investigação e que se pretende apresentar algumas das conclusões obtidas.

Os resultados das análises gráficas e estatísticas conexas realizadas comprovaram que a retração financeira associada à crise de 2007/08, e a crise económica nacional que levou à implementação das medidas de austeridade, a partir de 2011, afetaram severamente a atividade produtiva nacional, em geral, e a atividade do sector da construção, em particular, penalizando o emprego, e contribuindo para a diminuição do nível de vida e poder de compra da população residente. Para além destes impactos suscitados, a análise dos indicadores relacionados com a atividade do sector da construção e com as dinâmicas urbanísticas e imobiliárias registadas, confirmam que também ao nível espacial existiram mudanças significativas, que se

[1] Para a Grécia não existe informação disponível para os anos de 2011 a 2014.

refletem pela forma como os indicadores se expressam no território, seja à escala regional (NUT2), ou intra-municipal (ao nível da AML), entre 2005 e 2015.

Com efeito, assiste-se ao nível regional, a uma acentuada quebra da atividade do sector da construção, em termos de volume de negócios, sendo este particularmente mais acentuado na região do Algarve (>60%), e ainda, na AML, e nas Regiões Autónomas da Madeira (RAM) e dos Açores (RAA), a última com decréscimos assinalados na ordem dos 50%. No contexto metropolitano, a tendência de decréscimo é particularmente mais intensa na margem Sul, onde se evidenciam os municípios que sofrem as perdas mais elevadas (>75%), como é o caso de Sesimbra, do Montijo, de Almada e do Seixal. De realçar, tendo por base o "cálculo da diferença proporcional entre 2005-2008 e 2009-2014"[1], representativo da fase pré e pós crise financeira, que Sesimbra surge como o município que sofreu mais com o impacto da crise económica e das medidas de austeridade, registando a maior quebra proporcional de volume de negócios no período considerado. Em oposição, Oeiras regista um acréscimo (1,6%), embora pouco expressivo, mas evidenciando um comportamento atípico na tendência metropolitana (Figura 4).

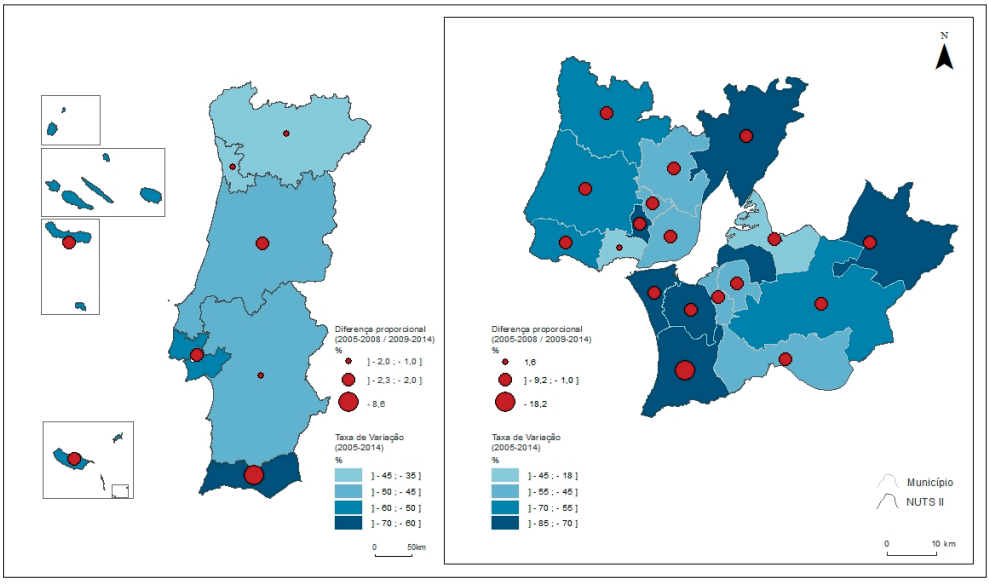

Figura 4: Proporção do Volume de Negócios de Construção no Total de Volume de Negócios, entre 2005 e 2014. Fonte: Elaboração própria; INE, Sistema de Contas Integradas das Empresas, (SCIE), outubro 2016

[1] Foi calculada a proporção do indicador para cada ano, respetivamente. Tendo em conta os dois períodos de referência foi calculada a média dos valores da proporção (tendo em conta o número de anos de cada período). Por fim, a diferença proporcional resulta da subtração do valor médio da proporção do segundo período de referência (2009-2014) com o valor médio da proporção do primeiro período de referência (2005-2008)

Observando-se também que as maiores perdas de emprego no sector da construção ocorrem nas Regiões Autónomas, Madeira e Açores, e nas regiões do Algarve e do Alentejo. E no contexto metropolitano, nos municípios do Montijo, de Sesimbra e de Almada. Em contraciclo, é de salientar o comportamento positivo do município de Oeiras (tv de 32,9%, entre 2005 e 2014), denunciando não só uma maior dinâmica como também revelando um maior nível de empregabilidade no sector (Figura 5).

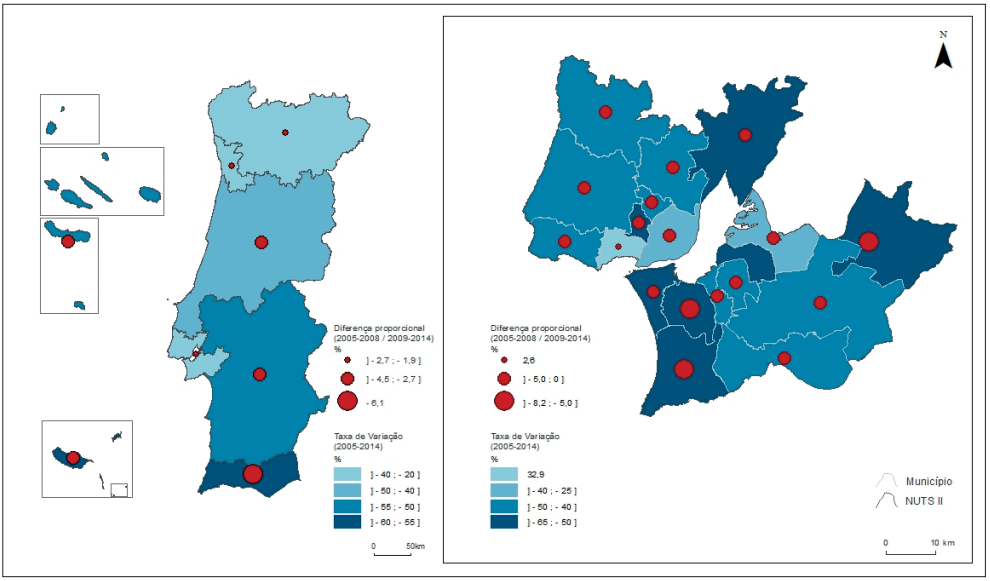

Figura 5: Proporção do Emprego na Construção no Total do Emprego, entre 2005 e 2014.
Fonte: Elaboração própria; INE, Sistema de Contas Integradas das Empresas, (SCIE), outubro 2016

O cenário de depressão económica e financeira também se faz sentir pelo decréscimo generalizado relativo às intenções urbanísticas e aos processos de transação imobiliária (compra/venda). Relativamente ao primeiro indicador, é de notar que apesar, de se confirmar que a tendência de desaceleração do processo de licenciamento já se fazia sentir no território nacional antes da crise, todavia, a situação conjuntural vem acentuar ainda mais esse comportamento regressivo, expondo uma menor capacidade de investimento em construção nova, como acontece na RAM (tv de (-58,8%)) e nas regiões de Lisboa (-58,4%) e do Algarve (-54,8%), entre 2009 e 2015 (Figura 6). Esta tendência de decréscimo do licenciamento também ocorre em contexto metropolitano, sendo, sobretudo, mais acentuada nos municípios de Sintra (variação de (-32,1%), entre 2005-2008, contra (-492,2%) em 2009-2015); de Odivelas (-26,1%), em 2005-2008, contra (-531,7%), em 2009-2015), e de Mafra (-33,6%), entre 2005-2008, contra (-51%), em 2009-2015) (Figura 7).

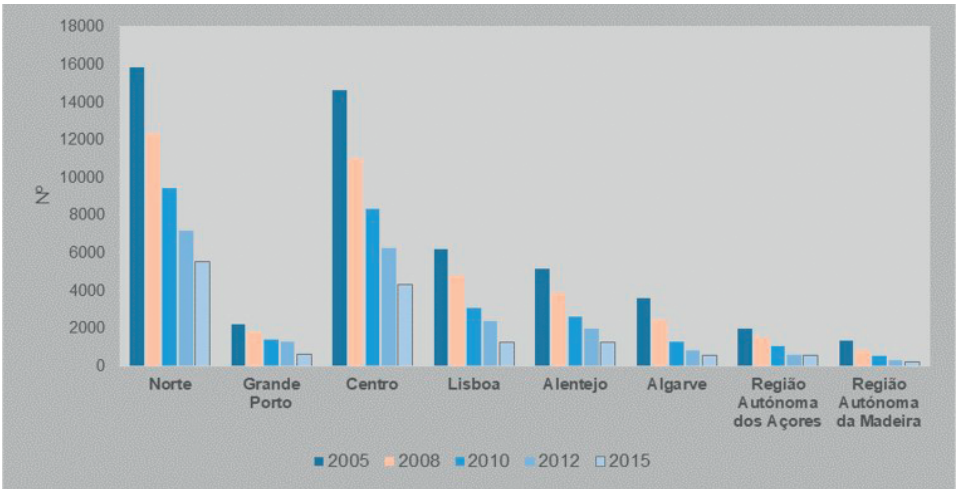

Figura 6: Edifícios Licenciados em Portugal (NUT 2), entre 2005 e 2015.
Fonte: Elaboração própria, INE, Inquérito aos Projetos de Obras de Edificação e de Demolição de Edifícios, julho 2016. Nota: Lisboa contempla a Grande Lisboa e a Península de Setúbal

Peculiarmente, Cascais, apesar de apresentar um decréscimo acentuado no licenciamento nos anos anteriores à crise, nos primeiros anos pós 2008 revela alguma capacidade em manter uma certa vitalidade urbanística, muito acima dos restantes municípios, mas que enfraquece a partir de 2011. É interessante inferir pela leitura dos dados de que parece ter havido uma transferência na pretensão urbanística do município de Cascais para o de Lisboa. De facto, Lisboa em 2012, e em 2014, assiste a um aumento significativo da intenção urbanística, de respetivamente 686 e 533 edifícios licenciados, não só face aos outros anos do período de referência, como também em relação às pretensões observadas nos outros municípios da AML (Figura 7).

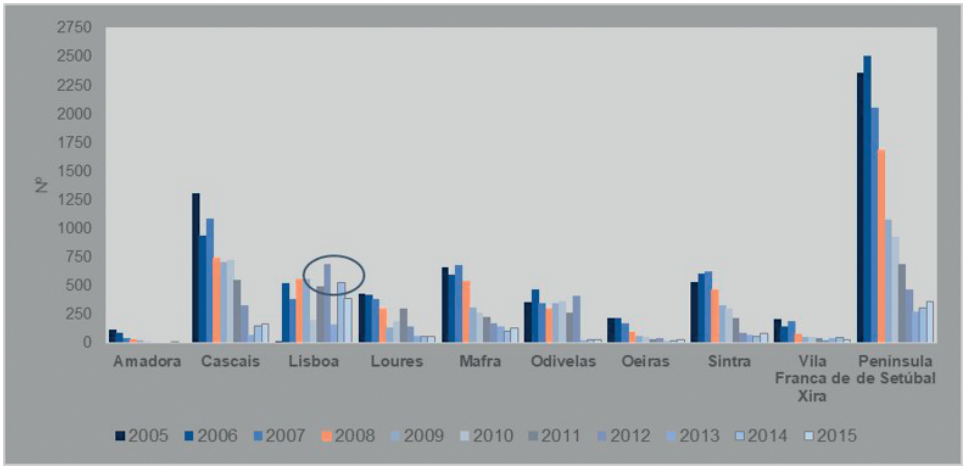

Figura 7: Edifícios Licenciados nos Municípios da Área Metropolitana de Lisboa, entre 2005 e 2015.
Fonte: Elaboração própria, INE, Inquérito aos Projetos de Obras de Edificação e de Demolição de Edifícios, julho 2016

Relativamente aos processos de transação imobiliária (compra/venda), importa sublinhar que existe uma quebra significativa no número de contratos de compra e venda de prédios realizados em todo o território nacional, entre 2005 e 2015, sendo, sobretudo, mais acentuada na RAM (-53,2%); na AML (-48,8%) e no Alentejo (-48,4%). Não obstante, uma análise mais fina desta variável permite perceber que nos anos mais recentes, já em período pós-crise[1], surgem timidamente, mas de forma consistente e continuada, sinais que indiciam uma tendência de inversão da situação, identificada inicialmente em Lisboa (município) e no Algarve, no ano de 2013, e nas restantes regiões, nos anos posteriores. No caso particular de Lisboa, é de realçar que esta alteração de comportamento é anómala no contexto da AML, e evidencia o ressuscitar do interesse pelo património imobiliário circunscrito à cidade de Lisboa, e que é comprovado pela taxa de variação positiva que detém a variável, entre 2009-2015 (26%) (Quadro 2).

Unidade Territorial	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005	Tx Var (2005-2008)	Tx Var (2009-2015)	Tx Var (2005-2015)
Almada	2035	1684	1757	1479	2084	2978	2855	3312	4328	4446	4654	-28,84	-28,72	-56,27
Amadora	1569	1405	1298	1353	1528	2523	2461	2713	3413	3199	3126	-13,21	-36,25	-49,81
Alcochete	287	188	275	350	223	386	782	427	431	557	1061	-59,75	-63,30	-72,95
Barreiro	723	579	678	601	873	1197	1146	1378	1618	1732	1981	-30,44	-36,91	-63,50
Cascais	3224	2535	2136	1678	2437	3701	3401	3939	5542	5745	5954	-33,84	-5,20	-45,85
Lisboa	13141	10019	7346	6381	8167	11187	10429	11448	14386	17404	17186	-33,39	26,00	-23,54
Loures	1759	1606	1384	1383	1806	3204	2778	3479	3995	3689	3760	-7,47	-36,68	-53,22
Mafra	1135	917	843	787	1085	1638	1570	1945	2520	2633	2941	-33,87	-27,71	-61,41
Moita	630	491	491	593	607	922	882	1079	1363	1400	1490	-27,58	-28,57	-57,72
Montijo	739	583	652	530	745	1082	982	1292	1552	1556	1667	-22,50	-24,75	-55,67
Odivelas	1253	1000	973	797	1267	2123	2015	2231	2946	3076	3098	-27,99	-37,82	-59,55
Oeiras	2049	1798	1467	1226	1982	3047	2466	4118	4278	4195	4789	-14,01	-16,91	-57,21
Palmela	777	921	692	605	889	1230	1318	1658	1855	2296	2020	-17,92	-41,05	-61,53
Sesimbra	949	751	649	634	907	1326	1299	1470	2077	2160	2136	-31,18	-26,94	-55,57
Seixal	1711	1458	1432	1302	1791	2739	2587	3135	3870	4291	4055	-22,69	-33,86	-57,81
Setúbal	1627	1217	1254	1330	1237	2054	1792	3041	3499	3400	3814	-20,27	-9,21	-57,34
Sintra	4146	3327	3389	3135	3930	5404	5155	6393	8194	8706	9162	-30,22	-19,57	-54,75
Vila Franca de Xira	1403	1057	1099	1005	1542	2245	1949	2555	3290	3609	3556	-28,15	-28,01	-60,55
Portugal	173692	148518	141839	142053	167496	209321	205442	241040	281365	285483	300044	-19,67	-15,45	-42,11
Continente	165389	141637	134892	134727	158574	198189	194746	228073	265314	270331	285470	-20,11	-15,07	-42,06
Norte	52970	46427	44758	46429	53263	64953	63659	72564	81277	82597	88665	-18,16	-16,79	-40,26
AMP	21931	18112	17259	18153	21742	27791	26790	30966	36030	36317	40700	-23,92	-18,14	-46,12
Centro	47778	42677	42561	44817	51229	56935	57089	65516	71927	72477	75717	-13,47	-16,31	-36,90
AML	39157	31536	27815	25169	33100	48986	45867	55613	69157	74094	76450	-27,26	-14,63	-48,78
Alentejo	10279	8927	9167	8923	10318	13778	13970	15947	18875	18962	19912	-19,91	-26,42	-48,38
Algarve	15205	12070	10591	9389	10664	13537	14161	18433	24078	22201	24726	-25,45	7,37	-38,51
RAM	3674	2665	3084	3325	4035	4652	5011	6284	9165	8357	7855	-20,00	-26,68	-53,23
RAA	4629	4216	3863	4001	4887	6480	5685	6683	6886	6795	6719	-0,54	-18,58	-31,11

Quadro 2 – Contratos de Compra e Venda de Prédios, entre 2005 e 2015

A par da diminuição do número de transações imobiliárias verifica-se um declínio do valor do imobiliário que é generalizado ao país e às regiões autónomas. Este efeito é, no entanto, mais pronunciado nas regiões do Algarve (variação (-44%) e do Norte (variação -38%), e menos expressivo nas áreas metropolitanas de Lisboa e do Porto,

[1] Entende-se por período pós-crise o momento a partir do qual Portugal deixou de estar sob a dependência do Programa de Austeridade e de Assistência Financeira, acompanhado pelo FMI, pela Comissão Europeia e pelo BCE (vulgo Troika).

apresentando taxas de variação de respetivamente (-28%) e (-29%), entre 2007 e 2015. Efetivamente, o impacto da crise (económica) e das medidas de austeridade impostas no país, a partir de 2011, condiciona o comportamento do indicador, constatação que é confirmada pela evolução do valor médio do indicador em termos regionais, onde se observa claramente uma diminuição do preço de venda médio a partir de 2008 até 2013, e uma tendência a estabilizar, nos anos posteriores (Figura 8). No contexto da AML, o comportamento do indicador não é uniforme, sendo evidente que os menores decréscimos ocorrem na margem Norte do Tejo, nos municípios de Lisboa e de Cascais, e na margem Sul, no município de Alcochete, e os maiores, somente na margem Sul, fundamentalmente nos municípios do Montijo, do Seixal e do Barreiro (Figura 9).

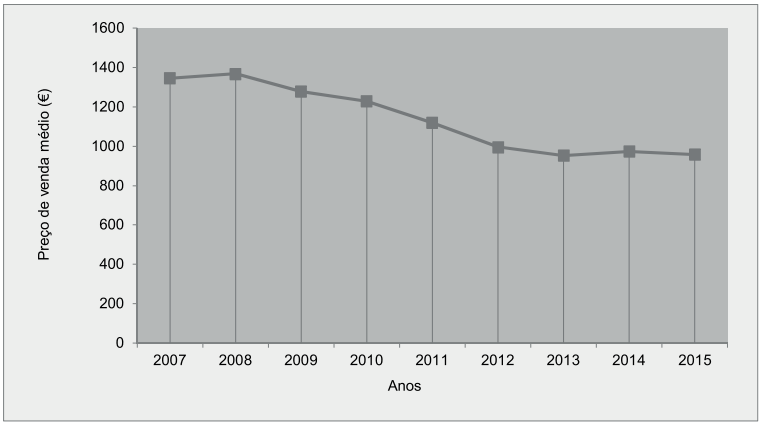

Figura 8: Valor Médio do Indicador em termos Regionais, entre 2007 e 2015. Fonte: Elaboração própria, Confidencial Imobiliário, Sistema de Informação Residencial, 2017. Nota: os valores apresentados resultam da média efetuada entre os valores médios dos municípios de cada região.

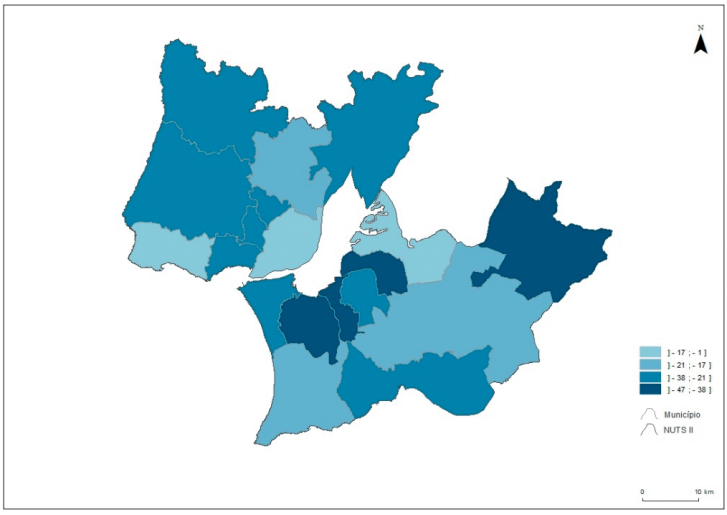

Figura 9: Sector Imobiliário Residencial – Preço de Venda Médio na AML 2007-2015.
Fonte: Elaboração própria, Confidencial Imobiliário, Sistema de Informação Residencial, 2017

Ainda no domínio da variável "Preço de Venda Médio", e reportando ao município de Lisboa, é de salientar que apesar, do efeito da crise na diminuição do valor do imobiliário ter sido mais lenta, face aos outros municípios da AML, a sua recuperação é progressiva, e com tendência a ser mais consistente, a partir de 2013, atingindo em 2015 um preço de venda médio da ordem dos 2.087 euros/m^2. A acrescentar a estes factos, a valorização imobiliária no segmento de luxo observada na cidade de Lisboa (logo seguida por Cascais), a partir de 2013, relativamente aos restantes municípios da AML, é de sensivelmente 13% entre os anos 2013 e 2015. Circunstância que para além de demonstrar a existência de assimetrias no seio da AML, em termos de preferências locativas ao nível residencial, não deixa, contudo, de ser uma situação anómala se tivermos em consideração que a sociedade portuguesa ainda se encontra no rescaldo de uma grave crise económica.

Mas, o que contribui para essa alteração? O que mudou nesse intervalo de tempo? De facto, ocorreram algumas mudanças do quadro económico nacional, a partir de 2013, potenciadas pela melhoria dos indicadores económicos associados à retoma do investimento estrangeiro no país, e à perspetiva de investimento imobiliário associada aos programas estatais – Vistos Gold e Estatuto de Residente Não Habitual (RNH)[1], e ao incremento da atividade turística, sobretudo, em termos de alojamento local, que se revelam eficazes no processo de alteração do ciclo regressivo da atividade construtiva e imobiliária, particularmente nas áreas urbanas onde estava enraizado um certo imobilismo imobiliário (centros históricos).

DESAFIOS SUSCITADOS PELA RECENTE CRISE SANITÁRIA

A investigação efetuada permite reconhecer que existe uma perceção generalizada de que o crescente aumento do investimento imobiliário, por parte de investidores estrangeiros e nacionais, e a perspetiva de rentabilização desse investimento no mercado de arrendamento, particularmente o de curta duração (alojamento local), foi benéfica para atenuar os efeitos da crise (económica), não apenas por impulsionar a atividade do setor mas, sobretudo, pelos efeitos que induziu noutros sectores de atividade económica. Contudo, paralelamente, é admitido que essa situação contribuiu para elevar a procura de habitação face a uma oferta limitada, pressionando a subida do valor do imobiliário para níveis motivados e orientados para uma procura internacional. E nesse sentido, potenciando processos de *gentrification* e de segregação do território urbano. Todavia, a recente crise sanitária relacionada com o COVID19 cuja dimensão e impacto económico ainda não é

[1] "O programa Vistos Gold deriva de um programa europeu de investimento que obedece a critérios específicos definidos por cada país que o adotou, facilitando a entrada e permanência nos países com dispensa de visto de residência, com possibilidade de aceder posteriormente à nacionalidade, desde que se encontrem salvaguardadas as condições de investimento definidas pelo país requerido. O estatuto de RNH representa um regime fiscal concebido para atrair para Portugal profissionais não residentes qualificados em atividades de elevado valor acrescentado, de caráter científico, artístico ou técnico, assim como, beneficiários de pensões obtidas no estrangeiro." (Araújo, 2020; p.102)

possível determinar com rigor, não apenas pela escassa informação que se encontra disponível, mas também pela imprevisibilidade quanto à sua duração. No entanto, é evidente que esta crise vem abalar o quadro de crescimento económico e de retoma do investimento estrangeiro no país, observado nos anos mais recentes, afigurando-se como essencial, no contexto deste capítulo, "um olhar", uma leitura, sobre o efeito desta situação epidemiológica na atividade da construção e do imobiliário, assim como sobre alguns dos fatores que a distingue da crise anterior. Assim sendo, salientam-se **três aspetos** que merecem alguma reflexão:

Em primeiro lugar, destaca-se, apesar do elevado grau de incerteza, os cenários económicos apresentados pelo Fundo Monetário Internacional (FMI) que asseveram que o impacto da crise sanitária nas economias mundiais é profundamente grave, manifestamente marcado por uma forte contração da economia em 2020, sendo bastante acentuada em Portugal (-8%) e na União Europeia (-6,1%) (Figura 10).

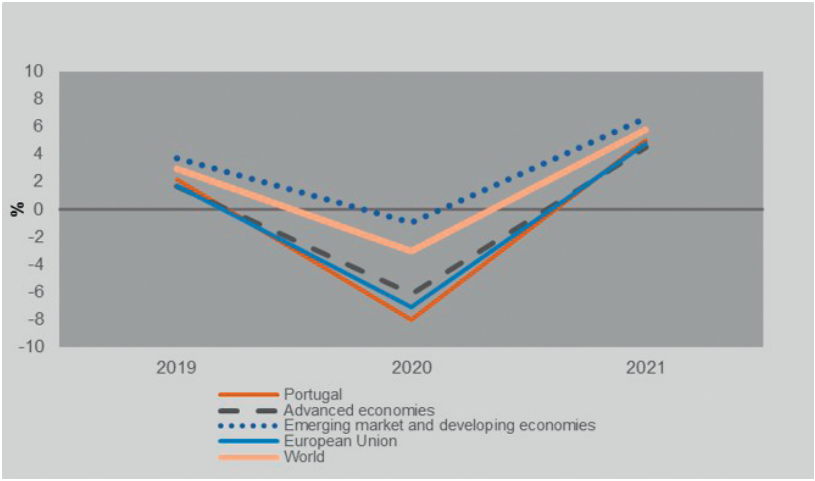

Figura 10: Crescimento Real do PIB.
Fonte: Elaboração própria, Fundo Monetário Internacional, acedido a 27 de setembro de 2020

Não obstante, existem sinais positivos que apontam para uma retoma económica global rápida em 2021, superando o nível de crescimento económico pré-crise sanitária. No caso particular de Portugal, apesar de também se perspetivar uma rápida recuperação do PIB nacional no corrente ano, todavia, a dívida pública aproxima-se dos 135% do PIB, e constata-se que a recuperação do emprego é lenta, e ainda distante do nível pré-crise (Figura 11).

Efetivamente, estes valores traduzem uma perspetiva de um cenário económico bastante enfraquecido, e que ainda não reflete o impacto do segundo confinamento no país, contudo, sendo muito diferente da crise económica e financeira de 2008, atendendo a que as entidades bancárias encontram-se mais capitalizadas e possuem mais liquidez para garantir o financiamento da economia nacional, tendo recentemente sido reforçadas pelo BCE. De notar, que até ao momento as entidades

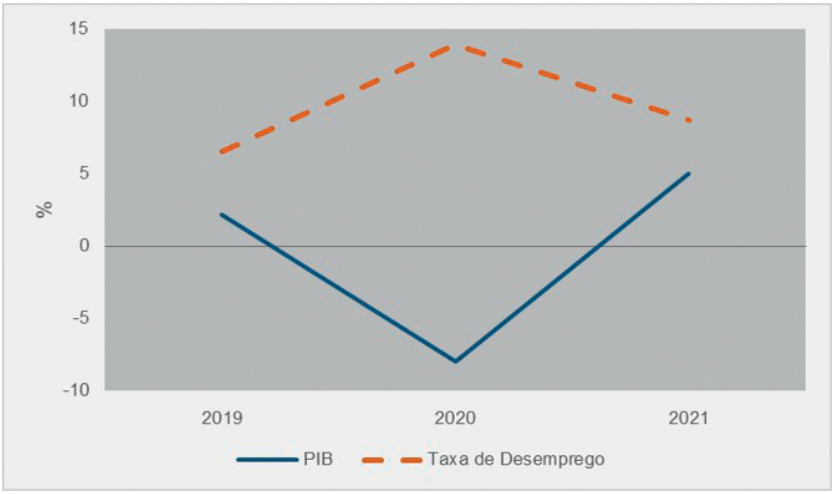

Figura 11: Portugal – Cenário Económico Adverso. Fonte: Elaboração própria, Fundo Monetário Internacional, acedido a 27 de setembro de 2020

bancárias têm assumido um papel relevante para minimizar o impacto económico da crise sanitária, facilitando o crédito de apoio ao desenvolvimento da atividade empresarial em geral, concedendo crédito para aquisição de habitação, para pagamento de *lay off*, e ainda, tendo um papel relevante na criação de moratórias para o crédito à habitação, facilitando a suspensão do pagamento das prestações durante o período da pandemia. Para além disso, o facto de existir uma previsão temporal (final do segundo semestre de 2021) para o início do processo de recuperação da economia nacional, constitui também, na nossa perspetiva, um elemento diferenciador relativamente à crise anterior.

Em segundo lugar, a constatação de que, apesar, da desaceleração da atividade económica registada no país, é observado algum dinamismo na atividade do sector da construção e obras públicas, manifestado pelo índice de produção no sector que é claramente positivo, entre novembro de 2019 e novembro de 2020 (tv. de 2,1%) (Figura 12). Não obstante, uma análise mais fina ao comportamento do indicador revela que ocorre um declínio da produção entre os meses de março e agosto de 2020 (tv. de -10%), situação que rapidamente é ultrapassada nos meses seguintes, para níveis pré-crise. Observando-se, como era expectável, uma quebra no número de transações, realizadas entre o quarto trimestre de 2019 e o segundo trimestre de 2020, no país (tv. de -32%; INE, 2020), que é particularmente mais acentuada na região do Algarve (tv. de -45%) e na RAM (tv.de -38,4%).

Inferindo ainda, pela análise dos dados disponíveis que o efeito imediato do confinamento e da situação pandémica ao longo do ano (nov2019-nov2020), não se traduziu por uma desvalorização do valor imobiliário residencial ao nível nacional. Se atendermos ao comportamento do indicador "Valor Mediano de Avaliação Bancária", constata-se existir uma grande resistência quanto à diminuição do valor

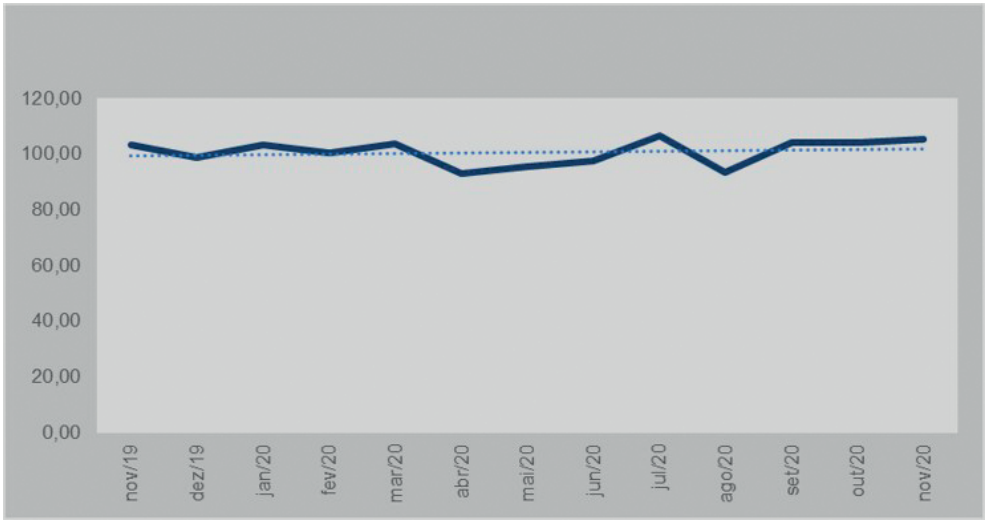

Figura 12: Índice de Produção na Construção e Obras Públicas. Fonte: Elaboração própria, INE, Índices de Volume de Negócios e Emprego (Base 2015), última atualização janeiro 2021

do imobiliário (tv de 6,3% entre novembro 2019 e novembro 2020 contra tv. de 3,1% entre março e novembro de 2020; INE 2020). Ainda assim, reconhecesse-se que as repercussões da crise sanitária no valor do imobiliário afetam, no contexto metropolitano, embora, de forma residual, os municípios de Lisboa, de Cascais e de Loures, entre março e novembro de 2020 (Figura 13).

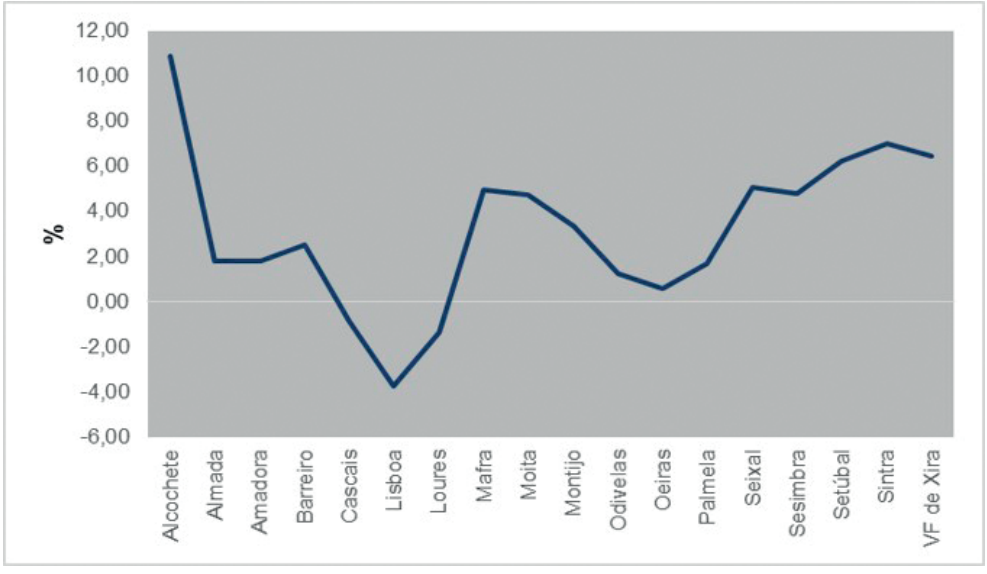

Figura 13: Taxa de Variação do Valor Mediano de Avaliação Bancária registado entre março e novembro de 2020. Fonte: Elaboração própria, INE, Inquérito à Avaliação Bancária na Habitação, última atualização dezembro 2020

Por último, a constatação de que o crescimento do turismo em geral, e do alojamento local, em particular, registado nos últimos anos, foi provocado por uma democratização do sector e por uma política de promoção turística muito consistente, por parte das entidades públicas com competência na matéria. Numa fase inicial, em plena crise da divida pública soberana (2010/11), o alojamento local surge como uma reação, ou melhor, uma opção em que a partir de um investimento reduzido era possível recuperar imoveis e disponibilizá-los para arrendamento de curta duração, oferecendo, numa fase inicial, uma boa rentabilidade, manifestamente superior à auferida pelo arrendamento normal (de longa duração). Mas, posteriormente, o seu crescimento encorajado pelos programas estatais é relevante para atenuar os efeitos da crise económica e financeira, assim como para impulsionar outros setores de atividade económica

Porém, as medidas de confinamento, as restrições em termos de circulação, viária e aérea, implementadas por quase todos os países do mundo, a partir do mês de março de 2020 (durante quase 2 meses), assim como as iniciativas, por parte dos privados, em encerrar todos os estabelecimentos hoteleiros, contribuíram drasticamente para deixar de existir atividade económica relacionada com este sector, condicionando igualmente toda a atividade económica conexa (restauração e comércio). Neste âmbito, atenda-se ao decréscimo acentuado das transações entre viagens e turismo, à escala nacional, atingindo em abril de 2020 o nível mais baixo de sempre (-85,45%) e mantendo-se em patamar negativo nos meses subsequentes (Figura 14).

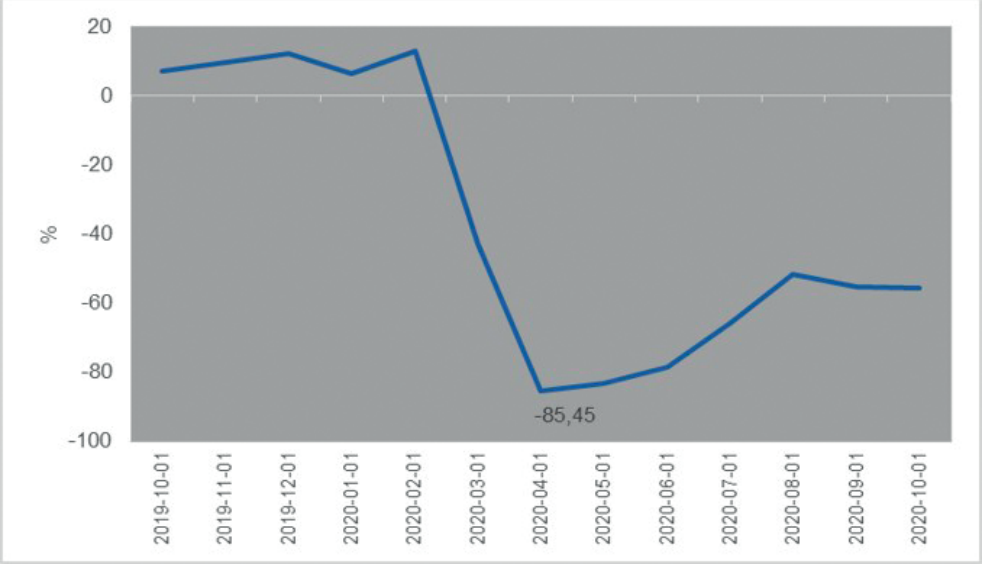

Figura 14: Viagens e Turismo - Transações (Taxa de Variação Homóloga). Fonte: Elaboração própria, Banco de Portugal, Estatísticas Externas-Balança de Pagamentos, 2021

Se por um lado, este decréscimo da atividade turística tem claramente um forte impacto (negativo) na economia do país e no rendimento das famílias, atendendo a que este sector representa aproximadamente 10,3% do PIB nacional (INE, 2019), e promove a criação de bastante emprego no país. Por outro, a quebra da procura turística nacional pode manifestar-se também por alguns reajustamentos do mercado de alojamento local, no sentido de passarem para o mercado de longa duração, por motivos associados a necessidades económicas, por parte dos investidores, embora a margem de lucro seja menor. Existindo ainda, em período pós pandemia, uma forte probabilidade de vir a ocorrer um decréscimo do número de dormidas associadas ao Turismo de Negócios, resultante da banalização e do sucesso da videoconferência, durante o período pandémico.

CONSIDERAÇÕES FINAIS

Alguns dos traços marcantes apresentados traduzem a geografia da crise nacional, e dão, sobretudo, uma imagem do país e da AML associada a uma conjuntura adversa ao investimento e ao consumo. De facto, o impacto da crise e das medidas de austeridade subsequentes realçou os territórios mais vulneráveis que, por esse motivo, foram afetados, de forma mais vincada, pelo desemprego, pelo enfraquecimento da estrutura produzida, pelo aumento de pobreza, assim como pela presença de uma paisagem devastada pela falta de investimento público. Para além disso, a instabilidade económica das famílias e as fortes restrições no acesso a financiamento contribuem para travar, em termos de transação e de promoção, a atividade construtiva e imobiliária nacional, revelando em períodos pós crise dos EUA e portuguesa, um mercado imobiliário nacional muito vulnerável e dependente do ciclo de financiamento.

Ficou claro que o crescimento do turismo e do alojamento local encorajado pelos instrumentos estatais constituem um processo de reação, por parte da sociedade e dos agentes económicos, ao impacto económico e social suscitado pela crise económica soberana, tendo sido, indiscutivelmente, importante para ajudar a economia e as famílias a ultrapassar os efeitos da crise.

Paradoxalmente, o protagonismo que a atividade do sector turístico desempenhou na dinamização e recuperação da atividade económica e imobiliária nacional, em período pós-crise, é no contexto da atual crise viral, motivo de preocupação e de desestabilização, sobretudo, pela grande perda de receitas gerada desde o início da pandemia, e pela possibilidade de vir a fomentar mais desemprego, caso a situação epidemiológica se mantenha por muito mais tempo. Por outro lado, tendo por base os dados disponíveis, constata-se que esta crise viral para além de ter encorajado a atividade do sector da construção ao tentar sustentar os índices de produção pré-crise revela também, uma certa resistência, evitando que ocorra um processo maciço de desvalorização do imobiliário residencial. Não obstante,

temos de reconhecer existirem dúvidas e incertezas quanto ao tempo de duração do segundo confinamento que agora se inicia[1], e naturalmente o impacto e a influência que esta situação pode ter na capacidade de adaptação e de resiliência demonstradas até agora.

Face a esta imprevisibilidade e também a alguns constrangimentos que esta crise fez expor, antevemos alguns desafios, nomeadamente para a atividade da construção e do imobiliário: **i)** A necessidade de alterar as características construtivas da habitação de forma a contemplar medidas que visem melhores condições higieno-sanitárias e a possibilidade da prática de teletrabalho; **ii)** A grande probabilidade de se verificar processos de deslocalização da população em situação de teletrabalho para territórios fora das cidades (metropolização), processo que pode contribuir para aumentar o *stock* de oferta de habitação nos centros urbanos; **iii)** O impacto que as restrições dos mecanismos estatais (Vistos Gold) podem suscitar nas duas principais cidades do país (Lisboa e Porto); e **iv)** A incerteza quanto ao tempo necessário para a recuperação do Investimento Direto Exterior (IDE) no sector imobiliário.

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Evolução e transformação do território. A "miscigenação" como fator impulsionador para criação de projetos de regeneração urbana

Territory evolution and transformation. "Miscegenation" as a driving factor for the creation of urban regeneration projects

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Resumo - *Ao estudarmos o processo de evolução urbana do território, verificamos que, por diversos fatores, nem sempre foi possível garantir total harmonia entre os elementos urbanos e a sua envolvente direta. Em alguns casos, por questões patrimoniais ou históricas, os elementos necessários para a sua transmutação ou evolução foram apenas acrescentados, criando um cenário misto entre elementos de natureza e época distintas. Por outro lado, houve a questão do acréscimo de elementos de natureza furtiva, para suprir algumas carências sentidas, que também contribuíram para esta falta de harmonia e conceção de cenários mistos entre elementos oficiais e oficiosos. Tendo em conta que o principal objetivo do processo de transformação do território é a sua valorização como meio humano, para que se garanta uma apropriação e utilização do espaço pelos seus beneficiários, verificamos que essa praticidade e a garantia da criação dos parâmetros mínimos para a valorização do seu meio físico nem sempre são exequíveis em cidades cujo invólucro se caracteriza pela existência de elementos de natureza oposta. Propusemo-nos, por isso, analisar neste capítulo o fenómeno da miscigenação de espaços como fator, não só de desvalorização, como também de impulsionador de projetos de regeneração urbana.*

Palavras-chave - Regeneração, transformação, miscigenação, funcionalidade, desvalorização

Abstract - *This chapter addresses a reflection on the phenomenon of "miscegenation", understood here as the mix or combination of different uses in urban spaces, and the potential of such mixes for guiding urban regeneration projects. It analyses several factors that are considered to be the basis for the existence of such cases. We believe that, due to its nature and consequences, the "miscegenation" could be a driving force of new urban planning practices.*

Keywords – Regeneration, transformation, "miscegenation", functionality, decline

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INTRODUÇÃO

O território de forma geral, enquanto espaço habitável e humanizado em que nos encontramos hoje, passou por um longo período de desenvolvimento e transformação, assinalado por variadas formas de ocupação e organização do espaço, até chegar a representação de cidade que detemos nos dias de hoje.

Durante a fase inicial do processo de transformação do território, foi muitas vezes possível criar cenários urbanos do zero, e por isso definir os espaços de forma menos limitada e mais uniforme, segundo as ideias dominantes na sua época de criação. Essa possibilidade tornou-se, a medida em que as cidades se desenvolviam, cada vez mais impraticável, por consequência da consolidação de espaços, como resultado dessa impossibilidade assumiram-se novos métodos de intervenção, que permitissem não só dar continuidade ao processo de transformação do espaço territorial como também respeitar e preservar a sua essência ou conteúdo.

Por esta ordem de ideias entendeu-se a regeneração ou reabilitação como método preferencial dos novos projetos urbanos. Esse novo modo de intervir no espaço da cidade, permitiria resolver não só questões funcionais, como estéticas, organizacionais e até meramente visuais, tivessem elas surgido ao longo dos anos ou fossem advindas da criação do espaço. A resolução por este método é marcada pela reconstrução de partes, pela renovação de elementos e recriação ou reestruturação de ideias, o que permite assinalar a continuidade do processo de transformação do território através de uma simples reorganização de conceitos e ideias. Essa necessidade continua de transformar, modificar, melhorar ou corrigir cenários urbanos é sentida em consequência de uma serie de variadas questões ou problemáticas que surgem e nos orientam a precisão de intervir no território. Essas problemáticas a que nos referimos, tomam-se como consequência da ocorrência de diversos fatores que definimos como: Naturais (tempestades, terramotos, tsunamis, chuvas fortes e outros); Humanos (êxodo rural, centros históricos, industrialização, desenvolvimento urbano, entre outros); Temporais (desgaste, desuso, funcionalidade, etc.). A ocorrência deste conjunto de fatores conduz a alterações na componente urbana e consequentemente a criação de cenários com características divergentes, e por isso nos conduzem a ideia e necessidade de intervir à procura por coerência.

A ocorrência e consequências de fatores naturais, ou acontecimentos da natureza, estão fora do controle do homem, sendo apenas possível, prever o que provavelmente aconteceria se demarcado fenómeno ocorresse em determinada localidade, sem garantias de que a destruição ou estrago seria maior, menor ou exatamente como esperado. A ocorrência de fenómenos dessa natureza, conduz-nos muitas vezes a necessidade de reconstruir cidades inteiras, não sendo possível pôr em prática ideias regenerativas, noutras situação podendo o impacto não ser tão grande conduz-nos apenas a necessidade de reconstrução de partes, podendo eventualmente nestes casos, ser fator de origem para criação de um espaço com caracterís-

ticas divergentes, permitindo exercer a ideia de uma possível regeneração de um todo ou de partes. Porém, no caso dos fatores humanos e temporais, a necessidade de reconstrução ou regeneração em consequência da criação de espaços com características divergentes pela ocorrência dos fatores, toma-se por garantida, uma vez que as consequências advindas da sua ocorrência são mais fixas e previsíveis.

Essa divergência entre formas, aspetos, funções e usos que podem ocorrer nos elementos constituintes do cenário urbano, conduz muitas vezes a criação de uma imagem e leitura urbana confusa e mesclada, dando origem a espaços miscigenados, transparecendo em alguns casos falta de harmonia e em outros falta de funcionalidade, e remetendo-nos o pensamento a falta de coerência e a necessidade de transformação. O termo miscigenação foi usado em 2001 por Bassand e a sua equipa no seu livro "Vivre et créer l'espace public". Referindo-se as miscigenações presentes no espaço publico, os estudiosos consideravam que este fenómeno seria um dos fatores de impulso para o exercício das práticas urbanísticas. Villanova (2001) no seu artigo sobre Novas Sociabilidades e Miscigenação Urbana, aborda o tema da miscigenação de forma mais abrangente a diversidade de conteúdos urbanos.

CONCEITOS

No conjunto de termos que iremos desenrolar, tentamos criar uma ideia conceitual, tendo em conta as várias ideias existentes e ajustando o simples significado da palavra ao que pretendemos retratar através dela neste capítulo. Apresentaremos uma ideia explicativa dos termos chaves deste capítulo e de alguns termos idealizados e apresentados neste capítulo, de forma a clarificar os nossos propósitos.

Mendes (2013) elucida em seu trabalho o conceito de regeneração, que foi introduzido e tem vindo a ser utilizado em urbanismo ao longo dos anos para representar uma forma de se poder intervir no território, com o objetivo de mantê-lo atualizado, a palavra em si representa o simples significado de recuperar ou renovar o que por alguma razão poderá estar danificado. Neste capítulo, usamos o termo em representação a nova modalidade dos projetos urbanos, falamos de regeneração como o ato de melhorar, corrigir, recuperar, reestabelecer ou revigorar conteúdos urbanos degradados, danificados ou sem funcionalidade, possibilitando a resolução de problemáticas através da produção de novos conteúdos, proporcionando a transformação e manutenção da imagem da cidade. Neste seguimento do que pretendemos com um projeto de regeneração, a transformação da cidade é refletida sob o ponto de vista evolutivo, como o ato de modificar, converter ou transmutar o território, em oposto a conservação, permite alterar formas, estados ou determinadas condições que nos conduzam a necessidade de mudança. Esta necessidade de mudança é tida como resultado da procura por coerência que se nutre em consequência da falta de funcionalidade de elementos da componente urbana. Neste capítulo a ideia de funcionalidade é vista em dois sentidos, no primeiro referimo-nos

a espaços que não apresentam condições necessárias para uma utilização, correspondente ao uso a que se destinam, por parte dos utilizadores, quer seja por falta de dimensionamento ou por inadaptação com o meio envolvente. No segundo ponto de vista, referimo-nos a falta de função de elementos que pelas suas características não são ou já não se encontram operacionais. Conceituámo-la então como a capacidade que determinado elemento da componente urbana tem de cumprir com a função que lhe foi atribuída. A perda de funcionalidade de componentes do meio urbano conduz-nos grande parte das vezes à sua desvalorização económica, física social ou ambiental, sendo um fator de relevância no desenvolvimento de projetos de regeneração. Assim, entendemos a desvalorização como efeito negativo de determinado fenómeno ocorrente no meio urbano, que conduz a depreciação do valor do seu conteúdo, seja do ponto de vista económico, social, ambiental ou meramente visual, realça a necessidade de se intervir para criação de coerência e supressão do que desfavorece.

Assim, introduzimos o fenómeno da miscigenação como fator de desvalorização de cenários urbanos. Com base no dicionário de língua portuguesa[1], podemos considerar o termo como a ação de misturar ou cruzar elementos pertencentes a grupos, espécies ou formas diferentes. Para a nossa análise, definiu-se espaços miscigenados como aqueles que, apesar de circunscreverem a mesma área geográfica do território, representam épocas, formas ou tipologias de ocupação visualmente distintas, quer seja a nível físico, tipológico, económico ou social. Para uma melhor perceção iremos conceituar e enquadrar as variantes que apresentamos e consideramos existirem no meio urbano.

– Miscigenação entre o oficial e o clandestino – Espaços urbanos onde os elementos construídos de forma legal, bem estruturados e capacitados para o uso a que se destinam, oferecendo comodidade aos utilizadores e uma lógica ocupacional aos observadores, cruzam-se com elementos disfuncionais, construídos sem regras e sem coordenação, cuja organização traduz-se num misto de funções, sem oferta de comodidade ou lógica ocupacional.
– Miscigenação entre o moderno e o degradado – Conteúdos urbanos onde se procede ou procedeu a construção de novos elementos, com características mais recentes em contraste ao estado de conservação dos elementos pré-existentes.
– Miscigenação entre o ativo e o inoperante – Referimo-nos aqui, a cenários onde os acontecimentos da vida cotidiana ocorrem de maneira constante e frequente em cruzamento com espaços, elementos ou objetos que por alguma razão não cumprem com a função que lhes é suposta tornando-se inoperantes e inutilizáveis.

[1] https://dicionario.priberam.org/miscigenado. Consultado em 12/01/2021.

MOTIVAÇÃO

A escolha deste tema surge em consequência de uma análise sobre os motivos que nos conduziram à necessidade de criar uma proposta de projeto para regeneração do núcleo antigo da freguesia da Póvoa de Santo Adrião, em Odivelas, levando-nos a refletir sobre os motivos que levam a praticar intervenções urbanas. Percebeu-se nessa análise que além da intenção de atualizar a imagem da cidade, essa urgência e necessidade de mudança, é sentida muitas vezes em consequência de algum contraste entre os elementos constituintes do cenário urbano, verificamos que em alguns casos o elemento negativo, quando isolado, não exercia influência sobre a necessidade de se criar um projeto de regeneração, mas sim, e apenas em determinadas situações sobre a ideia de se criar algo novo requalificando o espaço, ou, em outros casos, essa necessidade não era tão imediata. Por exemplo, os bairros clandestinos ou favelas, se isolados, ou fora do contexto urbano, com exceção ao meio ambiente natural, não exercem disparidade direta sobre conteúdos à sua volta, apesar de ainda assim deixarem evidente a necessidade de se intervir. Por outro lado, no caso de elementos inativos ou degradados, se isolados da parte ativa e moderna, apesar de nos conduzirem a ideia de regeneração, a necessidade não se toma por tão imediata como quando inseridos todos elementos no mesmo quadro.

METODOLOGIA

Tendo como base a análise qualitativa, a elaboração deste capítulo, foi desenvolvida com suporte nas impressões, pareceres, sensações e conhecimentos que tivemos em observar o meio urbano e suas componentes, na tentativa de perceber ou encontrar razões que contribuíssem ou induzissem a necessidade de criação de projetos de regeneração urbana. Para isso, observamos de forma indireta diferentes cenários urbanos a fim de perceber as suas dinâmicas. Fizemos também uma pesquisa exploratória a fim de desenvolver uma melhor compreensão sobre o tema e identificação dos possíveis fatores causadores dos fenómenos abordados. Apresentamos também, com base nas conclusões, algumas ideias conceituais na tentativa de clarificar a opinião do que pretendemos transmitir. Foi feita também, uma pesquisa bibliográfica, para se poder compreender e enquadrar algumas ideias de organização e formas ocupacionais que observamos.

EXEMPLOS DE REGENERAÇÃO URBANA

Em análise a miscigenação como fator de influência para a criação de projetos de regeneração, tomamos como exemplo a área portuária de Belém do Pará, no Brasil. Situada na zona histórica da cidade, até a intervenção a Estação das Docas[2], como é conhecida, encontrava-se inoperante, com marcas de degradação e desgaste, em

[2] http://www.estacaodasdocas.com

oposição ao ativo de pessoas e serviços existentes na sua envolvente. Dada a sua dimensão e importância, a estação tinha um efeito negativo para a área, representando desvalorização, abandono e talvez algum desconforto em termos de segurança. Por essa razão passou por um intenso trabalho de regeneração. Foi inaugurada no ano de 2000 com novos usos e uma imagem modernizada, passou assim a ser fator de atração turística. Além de exercer influência positiva no setor económico, social, ambiental e turístico da cidade, a sua modernização conduziu também a um maior interesse pela área e realce da necessidade de se regenerar os edifícios degradados de carater colonial afetos a sua envolvente. Ou seja, o elemento agora modernizado passou a ser fator de influência para a regeneração dos elementos degradados à sua volta.

Outro bom exemplo é o que tem vindo a acontecer com as favelas brasileiras, vistas como comunidades dentro de centros urbanos e dada a dimensão e o número de habitantes, em muitos casos torna-se impraticável destruí-las, realojar todas as famílias e construir algo novo em substituição. Como opção foi desenvolvido no Rio de Janeiro, o programa de reabilitação dos bairros de favela[3], em resumo, o projeto de intervenção visava levar os elementos necessários para ordená-las e reestruturá-las, tendo como objetivo final a diminuição da discrepância social entre os dois opostos e a melhoria da qualidade de vida dos seus habitantes. A intervenção durou cerca de 18 anos e mereceu o prémio City to City Barcelona FAD Award 2012. Em seguimento destes importantes projetos de intervenção e reabilitação, Abiko & Coelho (2009) desenvolvem um trabalho sob o projeto de recomendações técnicas Habitare, que foca na elucidação de procedimentos e técnicas para intervenção e urbanização de favelas, realçando a importância destas intervenções urbanísticas.

A MISCIGENAÇÃO DE ESPAÇOS

Neste trabalho alargamos o olhar sobre o fenómeno da miscigenação, considerando-o presente não só no espaço público, como também noutros elementos da componente urbana. Remetendo o pensamento ao conjunto de fatores humanos, verificou-se que a ocorrência de uma revolução industrial conduziu a uma aceleração do processo de desenvolvimento e transformação urbana do território, e como consequência dessa transmutação imediata ocorreu o êxodo rural, o que acarretou um aumento brusco da população nos centros urbanos. Apesar da evolução e transformação, as cidades nem sempre estavam preparadas para receber toda população e garantir a todos a melhoria de vida que era esperada. Não havendo muitas vezes sequer a possibilidade de garantir uma habitação ou um posto de trabalho para os que chegavam. Essa impossibilidade de meios em oposição a necessidade humana de um habitat e sobrevivência, levou a construção de moradias furtivas, e ao surgimento

[3] https://www.archdaily.com.br/br/01-58503/o-programa-de-reabilitacao-dos-bairros-de-favelas-do-rio-de-janeiro).

de postos de trabalho informais para suprir as carências apresentadas. Essa introdução de elementos não prognosticados conduziu a criação de cenários combinados entre elementos de carater legal ou oficial e clandestinos. Salgueiro (1977) debruça-se sobre a origem, formação e desenvolvimento de elementos dessa natureza, olhando para o conceito de clandestinidade sob o ponto de vista legislativo.

Para melhor entendimento da ideia que pretendemos transmitir, fomos buscar como exemplo, algumas cidades onde esse fenómeno miscigeno se destaca de maneira mais evidente e problemática, as cidades foram escolhidas após a leitura de alguns artigos publicados em sites e notícias que despertaram a nossa atenção e curiosidade, conduzindo-nos a fazer, através do google earth, uma visita virtual a estes locais, analisando de forma indireta a existência deste fenómeno:

– Bangladesh[4] visualmente distinguida, pelas construções clandestinas feitas em tijolo e chapa dispostas ao longo da Avenida Shaheed Tajuddin Ahmed e noutros pontos da cidade;
– São Paulo, Rio de Janeiro, Salvador, entre outras cidades brasileiras marcadas pelo fenómeno das favelas que se inserem nos seus centros (Sguizzardi Abascal, 2006);
– A cidade de Santa Fé[5] no México, que se encontra dividida entre os condomínios de luxo, os arranha céus e o conjunto de habitações informais de baixa renda na sua adjacente;
– A cidade de Mumbai[6] com o inegável contraste entre as áreas desenvolvidas e as favelas de Dharavi organizadas ao longo do rio Mithi no norte da cidade.

Estas cidades transmitem aos observadores uma imagem disfuncional e discrepante, remetendo-nos a noção de poluição visual, desorganização e disparidade social, os elementos furtivos desvalorizam o caráter do tecido e nos conduzem ao parecer de uma evidente necessidade de se intervir para regularização e criação de um cenário mais harmonioso, coerente e organizado.

Como estas, existem outras cidades com semelhante discrepância visual, porém com outra variante. Vejamos que o desenvolvimento urbano foi marcado pela construção de novas estruturas arquitetónicas, assim como uma nova forma de organizar o espaço citadino, no entanto e em muitos casos, as cidades possuíam uma componente patrimonial ou histórica, que muitas vezes já se encontravam com marcas deixadas pelo fator tempo, apresentando desgaste, deterioração e por vezes abandonados em consequência da alteração de questões funcionais. A cidade de Lisboa é um bom exemplo disso, a sua formação estabeleceu-se sobre uma base preexistente e os valores são assentes no respeito e preservação do património, por consequência

[4] https://www.publico.pt/2020/12/04/mundo/noticia/Bangladesh-transfere-refugiados-rihingya-ilha-remota-onde-há-frequentes-inundacoes-1941780. Consultado em 14/01/2021

[5] https://www.urban-hub.com/pt-br/cities/mumbai-maharashtra-india-2/ Consultado em 12/01/2021

[6] https://www.voucontigo.com.br/main-bazaar-nova-delhi/ Consultado em 15/01/2021

disso, em muitos casos para que o processo de evolução e transformação urbana ocorresse, foram apenas adicionados os elementos necessários para a sua reclassificação como espaço urbano, mantendo a arquitetura inicial e adaptando caminhos, não tendo sido possível em alguns casos garantir total funcionalidade dos espaços e harmonia entre os seus elementos. Em análise, levantou-se a seguinte questão: Será que a adaptação de elementos da componente urbana a espaços com características físicas divergentes poderá conduzir-nos realmente à criação de um espaço urbano coerente, ou apenas à conceção de um novo cenário visualmente protagonizado por elementos da componente urbana?

Neste caso consideramos a segunda opção, a sobreposição de elementos advindos de épocas e formas de ocupação e apropriação distintas nem sempre nos permite criar espaços harmónicos ou coerentes, levando-nos, no entanto, a possível criação de um contraste entre o "moderno e o degradado", o "ativo e o inoperante". Vejamos que a funcionalidade se toma muitas vezes como consequência do tempo e local onde o objeto ou ação se insere ou enquadra, nesse sentido uma sobreposição de ideias e usos poderá consequentemente resultar na descaraterização e supressão dos aspetos funcionais, nesse sentido tem se notado inúmeros esforços na intenção de melhorar estes cenários através de projetos de regeneração e requalificação urbana.

A MISCIGENAÇÃO COMO FATOR DE DESVALORIZAÇÃO

Como referido anteriormente, a falta de funcionalidade, de elementos no meio citadino encaminha grande parte das vezes ao abandono do espaço ou objeto, noutras a uma apropriação não correspondente ao uso que realmente lhe era presumível, temos como exemplo, as antigas áreas portuárias e industriais que caíram em desuso, a marginalização destes espaços, em alguns casos abandonados noutros ocupados de forma clandestina, em contraste com uma envolvente coeva podem ser vistos como um fator de desvalorização física, económica uma vez que influem indiretamente sobre o valor do imóvel local, consideramos também como fatores de desvalorização ambiental e social, porque quando abandonados e marginalizados contribuem diretamente para o aumento dos níveis de insegurança.

O mesmo acontece com os espaços que representam o misto entre o oficial e o clandestino, como as cidades que exemplificamos anteriormente, ao observarmos a sua imagem, percebemos que materializam problemas económicos e sociais, sendo que as construções clandestinas, ou a existência de postos de trabalho informais, transmitem a noção de insegurança e desordem, e realçam visualmente a desigualdade entre diferentes classes sociais. Nestas situações podemos evidenciar também a notável acumular de usos que se geram, em oposição a organização de usos decretadas oficialmente onde se distingue uma habitação do edifício comercial e dos serviços, no núcleo clandestino, tais atividades encontram-se sobrepostas, podendo

uma construção servir simultaneamente para habitação como para a prática de comércio e oferecimento de serviços. Essa concentração de atividades, dada a dimensão das suas construções e a ausência de normas regentes, traduz-se nas condições de vivência precária que se refletem na desordem que elas patenteiam. A escala da cidade essa miscigenação de usos poderá ser considerada um dos fatores na base para criação do "caos urbano", em resumo a artigos, noticias e textos lidos, verificamos que algumas cidades como Lagos[7] na Nigéria, Mumbai[4,8] e Nova Delhi[5], ambas na India, vêm diariamente as suas ruas preenchidas por um misto de atividades que se desenvolvem em simultâneo, algumas correspondente ao uso a que se destinam e outras de carater informal, impedindo a elaboração de uma leitura coerente do espaço, o que se reflete em desordem e insegurança, desvalorizando e descaracterizando o espaço de forma física, social e ambiental. Lara et al. (2012) aborda o fenómeno do caos como uma nova forma de olhar para o território urbano.

Em análise a importância da coerência nos projetos urbanos, podemos concluir que a miscigenação em cenários urbanos, conduz muitas vezes a criação de problemáticas levando falta de interesse e inadaptação por parte dos usuários e consequentemente muitas vezes ao abandono da área, por esta razão considera-se que são fatores de influência para necessidade de criação de projetos de regeneração urbana em combate a descaraterização e desvalorização de conteúdos urbanos.

CONSIDERAÇÕES FINAIS

Imaginemos agora se a área portuária de Belém do Pará não estivesse inserida numa zona ativa, mas noutra igualmente degradada, abandonada e inoperante, longe da população e dos serviços. Será que o interesse pela sua regeneração como elemento isolado seria o mesmo? Será que o impacto teria sido igualmente positivo e conduziria ao interesse individual pela reabilitação dos elementos degradados a sua volta e a sua respetiva valorização? E no caso das favelas, ou bairros clandestinos, será que haveria igual interesse e necessidade de regenerá-los se estas comunidades não estivessem já encaixadas nos centros urbanos?

O facto da inoperante área portuária de Belém do Pará estar inserida numa zona ativa poderá ter conduzido a procura e utilização da Estação das Docas e ao respetivo interesse pelos elementos à sua volta. No cenário sugerido, a regeneração de um único elemento poderia não produzir os efeitos esperados, seria para isso necessário reabilitar a área como um todo a fim despertar o interesse da população, tornando-a numa área ativa. O mesmo se pode dizer no caso das favelas e bairros clandestinos, se não estivessem inseridos em centros urbanos consolidados, não

[7] https://www.britannica.com/topic/role-of-Nigerian-women-1360615 Consultado em 24/11/2021

[8] https://thecityateyelevel.com/stories/retomando-mumbai/ Consultado em 24/11/2021

haveria a necessidade imediata de se regenerar e alterar o seu contexto em harmonia a sua envolvente.

Queremos com isso dizer que, o facto de haver um fator positivo, conduz-nos e realça a necessidade de eliminar o que há de negativo. Se estamos perante uma área urbana dinâmica, o que estiver inoperante nos chamará a atenção como fator negativo, conduzindo-nos a ideia e necessidade de reabilitar para transformar, tornando-o funcional. O mesmo acontece quando elementos modernos ou modernizados se inserem numa envolvente degradada, ou quando entre elementos de génese legal surgem os furtivos.

Em conclusão podemos dizer que, a miscigenação de componentes com particularidades distintas nos centros urbanos, realça a necessidade de se intervir a fim de regenerar o espaço para a conceção de um ambiente coeso. Sendo que, devido às dinâmicas de transformação constante do espaço urbano, a regeneração toma-se por um processo contínuo e necessário para a conceção de cenários harmoniosos, por essa razão, e tendo em conta que os principais fatores de influxo para a criação da tipologia de espaços miscigenados que apresentamos tomam-se por humanos e temporais, podemos dizer que será sempre um fator de influência para o exercício dessa necessidade urbanística.

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O transporte coletivo informal em São Tomé e Luanda. A dimensão territorial do sistema de transporte público

Informal transport in São Tomé and Luanda. The territorial dimension in the public transport system

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Resumo - *Nos últimos 30 anos, tem-se assistido nas cidades africanas à substituição do Transporte Público Formal pelo Transporte Coletivo Informal de baixa qualidade, ainda que seja o modo predominante. Estas dinâmicas têm excluído sócio-geograficamente a população mais vulnerável. Tomando como situações exemplares os casos de São Tomé e Luanda, este estudo pressupõe que as diversas dinâmicas de uso do território associadas ao sistema de Transporte Coletivo Informal, indicam a possibilidade de criação de um paradigma de gestão de transporte assente em políticas e estratégias integradas. Considera-se que estas podem impulsionar níveis mais eficientes de serviço, com qualidade e maior justiça e equidade sócio-espacial. Com a finalidade de promover uma mobilidade inclusiva, no fomento de políticas e modelos que alcancem um sistema de transporte sustentável, a pesquisa tem como objetivo identificar diretrizes para a elaboração de um Plano de Mobilidade e Gestão de Transporte em São Tomé e Luanda. O estudo estabelece orientações que propiciem a regulamentação de Transporte Coletivo Informal nos países em estudo.*

Palavras-chave - Mobilidade sustentável, modelo de gestão, transporte coletivo informal, planeamento do território

Abstract - *Over the last 30 years, African cities have seen the replacement of formal public transport by low quality informal transport, even though the former is still the predominant mode of transport. Such a process has socio-geographically excluded the most vulnerable population groups. Taking the cities of São Tomé and Luanda as exemplary cases, this study assumes that the different dynamics of land use associated with the informal transport system indicate the possibility to establish a new transport management paradigm based on integrated policies and strategies. These can be regarded as drivers of a more efficient service, with quality and provider*

of greater socio-spatial equity and justice. In order to make mobility programmes more inclusive, backed up by policies and models for a sustainable transport system, this research aims to identify guidelines for the elaboration of a Mobility and Transport Management Plan for São Tomé and Luanda. The study establishes guidelines that facilitate the regulation of the informal transport sector in the corresponding countries.

Keywords - Sustainable mobility, management model, informal transport sector, land use planning

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URBANIZAÇÃO E MOBILIDADE EM ÁFRICA

A célere e crescente taxa de urbanização do continente africano ganhou amplitude após a descolonização e, sobretudo, nas capitais nacionais que se estabeleceram como *"locais de concentração e afirmação dos novos poderes"* (Medeiros, 2006: 192). Atualmente, 55% da população mundial reside em áreas urbanas e até 2050 prevê-se que o fenómeno se acentue e chegue a 70%. Este crescimento traz as questões urbanas para o centro da agenda política global (ONU 2019).

As crises económicas e políticas geram fluxos migratórios com destino às cidades. Produzem a dispersão da população e a formação de espaços segregados e informais, com forma urbana desregrada, que se articulam a partir dos eixos de comunicação. As cidades, neste contexto, são o *"espaço refúgio por excelência (onde se foi) cimentando uma urbanidade diferente, percorrida por tradições seculares, mas de grande contemporaneidade"* (Medeiros, 2006:195). Tais ocupações territoriais avulsas seguem a lógica da procura de condições mais propícias à vivência e às necessidades das comunidades, estabelecendo-se relações informais de continuidade, onde a mobilidade, também informal, suporta as atividades e permite a manutenção da relação destes novos espaços com os territórios consolidados à época da independência.

As lógicas de mobilidade durante o período colonial, seguindo os objetivos definidos à época, estavam assentes sobretudo no ganho e eficiência económica e não tanto no serviço às comunidades ou na resposta às necessidades de integração territorial. Após a independência dos países africanos, a expansão urbana que se seguiu nem sempre foi acompanhada de desenvolvimento, fator transversal à pluralidade dos países do continente, mormente ex-colónias dos países europeus (Bussière, Madre & Mendoza, 2002).

A generalidade da morfologia das cidades africanas atuais são fruto de complexas lutas territoriais internas[1], apresentando espaços urbanos que acolheram, à pressa, populações vindas de áreas rurais numa tentativa de maior conforto/proteção face aos conflitos armados. Estas áreas urbanas são, assim, fruto de um crescimento informal, rápido e desordenado (Pieterse, 2010), propiciando pobreza e problemas de subdesenvolvimento que, como afirma Amaral, são *"um bom exercício de reflexão"* (Amaral, 1983:299).

As reformas económicas e políticas de alguns países africanos têm sido acompanhadas de políticas territoriais, nomeadamente ao nível da gestão urbana, da descentralização e da prática de boa governança (Medeiros 2006). As áreas urbanas, como espaço de prestação de serviços por excelência, e de centralização de atividades administrativas, são elementos centrais para as questões da mobilidade e acesso a esses serviços. Os padrões de mobilidade decorrem da combinação, integrada de fatores. O uso e

[1] Disputas territoriais, crises políticas, rivalidades tribais (questões étnicas ou religiosas), etc., muitas com raízes nos processos conturbados de colonização/descolonização.

a ocupação do solo, decorrentes das necessidades das comunidades, estabelecem-se como elementos essenciais para o desenho do sistema de transporte urbano, assim como dependem desse sistema para a melhoria das condições oferecidas pelo espaço.

É ainda diminuta a produção de conhecimento integrado sobre as cidades africanas, o seu crescimento, motivos e vivência. As abordagens setoriais não permitem uma visão estruturada e relacional entre as causas e as consequências do crescimento urbano. Esta ausência de visão global, que não se limita a África, dificulta a definição de políticas territoriais eficazes, incluindo-se aqui a definição de políticas públicas de mobilidade que possam auxiliar o incremento das condições de vida das comunidades.

O PLANEAMENTO DO TERRITÓRIO EM ÁFRICA

A explosão demográfica, o acelerado processo de urbanização e a motorização tornaram, no continente africano, a atividade de planeamento da mobilidade urbana em *"algo imprescindível e indissociável do planeamento do uso do solo"* (Panitz, 2006: 115). Em alguns países do continente, os planos vigentes remontam à época colonial, elaborados numa lógica de zoneamento e assentes em taxas de crescimento populacional controladas e que respondiam, mormente, aos anseios e estratégias centrais no aproveitamento dos recursos. No período pós-colonial, as políticas territoriais decorrem de respostas setoriais, não integradas e, problema que não está apenas restrito a África, sem uma monitorização das respostas dadas. Há, generalizadamente, uma indiferença perante os erros praticados e os seus resultados, não se reconhecendo a crise urbana e nem havendo responsabilização pela promoção de uma mudança (Pieterse, 2010). Sem uma visão integrada de planeamento, as políticas de mobilidade e a integração com os usos do solo, resultam na ineficiência dos processos e na dificuldade de utilizar racionalmente os recursos, promovendo, para além dos danos ambientais, a exclusão e a discriminação geográfica, interferindo na vida das comunidades e no desenvolvimento do território. (UN-HABITAT & UITP, 2010).

Os governos africanos têm-se distanciado da agenda mundial e, por isso, afastam-se da criação de processos de gestão eficiente do território, nomeadamente não recorrendo a procedimentos de inclusão das comunidades como parte da solução, numa visão *bottom-up* e adequada para uma governança urbana que fomente a cocriação. Sem a adoção de processos inclusivos, a perceção dos problemas e a sua resolução no sentido de alcançar os Objetivos de Desenvolvimento Sustentável [ODS] é dificultada (ONU, 2019). As cidades africanas são tidas como um sistema individualizado, sendo descurado o seu potencial multiescalar para o desenvolvimento territorial e a geopolítica mundial. Os processos locais de desenvolvimento tendem a não assentar em estratégias que permitam corrigir dissimetrias a vários níveis (políticas, sociais, ambientais e económicas), e reduzir bolsas de pobreza. Uma visão integrada e inclusiva das comunidades, poderia permitir um desenvolvimento territorial mais eficiente e em linha com as necessidades coletivas.

Importa também que, no contexto do planeamento, se inclua o informal, ou pelo menos as experiências de informalidade que inferem uma maior adaptabilidade à mudança (flexibilidade), em prol do interesse coletivo e dos objetivos fixados. Os estudos contemporâneos no âmbito do planeamento, sobretudo em África, indiciam o papel que o sentido transfronteiriço detém no estimular da criação de corredores de desenvolvimento, nomeadamente a partir de uma política regional integrada, atendendo os novos paradigmas (Gomes, 2007; Ascher, 2010; Simone, 2010; Parnell & Simon, 2014). Simone (2010: 29) enfatiza sobre as questões críticas do planeamento individualizado em África e as potencialidades em inverter o panorama, através do fortalecimento da conectividade estratégica das cidades (planeamento integrado), como *"espinha dorsal do futuro desenvolvimento económico regional africano"*.

Porém torna-se necessário repensar a definição dos indicadores para o desenvolvimento, não esquecendo o que se entende, ou deve entender como desenvolvimento em cada local /contexto (Ascher, 2010; UN-HABITAT & UITP, 2010). Isto porque, os conceitos costumam ser hegemónicos e eurocentrados e, nem sempre, correspondem às necessidades de realidades territoriais complexas como as africanas, falhando na adequação de estratégias que permitam o desenvolvimento das comunidades, o acesso e uso eficiente dos recursos. Por outro lado, o peso do passado, numa visão dominante do pensamento europeu, dificulta a centralização do pensamento naquilo que é o território africano e, *"para que isso mude na escala da cidade, é necessária uma mudança política transformadora, principalmente, embora não exclusivamente, no nível do governo central"*[2] (Parnell & Simon, 2010: 49). Importa, então, no contexto do planeamento territorial em África, interpretar as *"novas territorialidades intra-urbanas, com acentuação, em muitos casos, da fragmentação do espaço urbano"*. A fragmentação, *"associa componentes espaciais (desconexões físicas, descontinuidades morfológicas), sociais (segregações residenciais, retraimentos comunitários), económicas e políticas (dispersão crescente dos actores e autonomização dos dispositivos de gestão e de regulação urbanas)" (Medeiros, 2006:196)*.

As políticas territoriais devem centrar-se no combate às fragilidades e na definição de estratégias de integração. Será de interesse para o desenvolvimento, que se atinjam níveis de integração física e social que assegurem às comunidades o acesso eficiente aos recursos e uma morfologia que permita a vida qualificada das comunidades. Para tal desiderato, importa o investimento numa visão estratégica, transversal e territorialmente abrangente, que considere as relações que se estabelecem e que permite a definição de objetivos tangíveis, adequados à especificidade de cada local, mas que incluam uma visão global integradora e sempre com e para as comunidades. É importante que, na definição de indicadores para o desenvolvimento, se considerem as particularidades, os interesses das comunidades e, com elas, se estabeleçam os objetivos.

[1] "(…) the African urban present is locked into the dysfunctionalities of the past. For this to shift at the city scale requires transformatory policy change, principally though not exclusively at the central government level" (Parnell & Simon, 2010: 49).

No âmbito da definição de indicadores, a escala (dimensão) dos assentamentos urbanos é um fator crítico. O grau de urbanização ou a definição conceptual e dimensional de aglomerado, varia no tempo e no espaço, i.e., depende da contextualização específica do território onde se aplica, pois depende de fatores diversos como os recursos disponíveis, a densidade populacional como um todo, ou as dinâmicas territoriais (que também dependem das políticas).

Importa que, no contexto das políticas territoriais, e em concreto nas que incidem nas áreas urbanas, as medidas a adotar, considerando a dimensão de cada aglomerado, definam estratégias inclusivas, assumindo as diferenças, mas assegurando que estas funcionam como integradoras e não como fatores de exclusão. Há também que assegurar a comparabilidade entre regiões, pelo que as Nações Unidas definem 3 dimensões - cidades, áreas rurais e áreas semidensas - flexibilizando ao grau de urbanização um *continuum* entre as cidades e as áreas rurais, o que propicia um pensamento híbrido em detrimento da tradicional dicotomia urbano-rural (OCDE, 2020).

A contemporânea e rápida expansão urbana impediu que o planeamento acompanhasse a realidade e os problemas associados, prevalecendo uma urbanização desordenada, na qual dois terços da população reside em *slums* (Bussière, Madre, & Mendoza, 2002; Watson & Agbola, 2013; Aragão, 2014). Idealmente, os planos de planeamento e ordenamento do território devem ser prioridade de investimento do Governo. Enquanto uma conceção avançada de planeamento, o desenvolvimento económico passa pela institucionalização do plano, como instrumento gerenciador de projetos e investimentos em vários sectores. Todavia, as questões da mobilidade e do transporte dos territórios em estudo, estão entorpecidas, dificultando estabelecer relações multissectoriais (Panitz, 2006; Aragão, 2014).

Não raras vezes, a política urbana, ou a sua ausência, é propiciadora de movimentos migratórios desnecessários de áreas 'menos' favorecidas para áreas sentidas como 'mais favorecidas', gerando desequilíbrios. A mobilidade ocupa um lugar de destaque nas atuais problemáticas das áreas urbanas (Fermisson et al, 2004) e deve estar integrada nas políticas urbanas. No nexo africano, a expansão urbana, a inversão dos padrões de mobilidade e a promoção das questões de sustentabilidade representam um desafio, no qual a mobilidade desempenha um papel importante para o desenvolvimento territorial.

A MOBILIDADE URBANA

O conceito de mobilidade é amplo e inclui, para além da circulação, as condições dadas, os meios e a oferta de serviços disponíveis para que as comunidades possam aceder, ou ser servidas de bens, serviços e informação. Neste conceito incluem-se as novas formas de acesso, como as vias digitais. No entanto, pelo uso excessivo de transporte individual, quer decorrente do comodismo/facilitismo quer da ausência de oferta adequada, não raras vezes por ausência de planeamento que não

permite o estabelecimento de redes eficientes, as questões da mobilidade são cada vez mais centrais. Para o desenvolvimento dos territórios é necessário assegurar o acesso das comunidades aos recursos, permitir a convivência e relações entre indivíduos e garantir o fornecimento de bens de forma adequada.

A mobilidade urbana sustentável é uma prioridade das Nações Unidas desde a década de 1980, embora seja um conceito que tem motivado muitas discussões ao longo das últimas décadas, surge *"como um novo desafio às políticas ambientais e urbanas, em um cenário de desenvolvimento social e econômico"* (Smaniotto Costa, 2014: 1). A Agenda 21, aprovada na Conferência do Rio em 1992 (UN, 1992), inclui nos objetivos a problemática dos transportes, quer no que respeita à necessidade de promover melhores condições para as comunidades, incluindo fatores de segurança e acesso a bens e serviços (cf. capítulos 7 e 9), quer de forma transversal nos vários capítulos, no que respeita à diminuição da poluição. A planificação territorial deve incluir os fatores relacionados com os transportes assegurando o acesso a bens e serviços, mas também permitindo o desenvolvimento das relações sociais.

As crises económicas propiciam o surgimento de atividades informais como resposta às necessidades das comunidades, como efeito da falta de resposta dos Estados. A falta de resposta dos serviços públicos de transporte, a sua vulnerabilidade e a oferta de sistemas informais, capazes de servir os interesses básicos das comunidades, permitiram que o sistema informal de transportes se consolidasse nas rotinas do cidadão (Santos et al., 2020). O transporte coletivo informal é amplamente utilizado pelos mais marginalizados, permitindo o acesso aos serviços básicos (educação, saúde, bens essenciais, emprego, etc.). Constitui também, *"um legado duradouro de outra crise (...) mesmo enquanto a população crescia, e operadores "não-estatais preencheram as lacunas" (Surico, 2021).*

Nos países em vias de desenvolvimento, os impactes do sector de transporte representam, em média, 5% do PIB. Na maioria dos países do continente africano isto corresponde ao aumento de serviço de transporte pela crescente demanda, altas taxas de motorização, ausência de infraestruturas, maiores índices de pobreza, congestionamento, crescentes índices de poluição, elevados efeitos colaterais sobres a saúde, agudizando as dissimetrias locais e regionais. Embora as cidades sejam vetores de riqueza, a rápida "deterioração" das políticas de mobilidade e transporte nas cidades da África subsariana lesam em 10-12% do PIB, tal como 20% nas cidades sul africanas.

A mobilidade em África é complexa e depara-se com enormes desafios. O aumento da população, a pobreza generalizada, a incapacidade pública, os congestionamentos e a escassez de recursos para transportar pessoas e bens, são aspetos que interferem com o desenvolvimento económico e produtivo (UN-HABITAT & UITP, 2010). Más políticas imbricam na produtividade económica, equidade social e proteção ambiental, com impactos diretos na qualidade de vida do cidadão. A inversão passa por conciliar a procura/resposta, direcionando o cidadão para uma mobilidade mais

sustentável. Mas isso implica estratégias de planeamento, a várias escalas e transversais, que suportem as políticas que estabeleçam padrões de mobilidade para os anos vindouros, assegurem às comunidades o acesso aos recursos, serviços e informação, permitam as deslocações e o usufruto dos territórios, e o estabelecimento de relações sociais.

Para promover uma política de mobilidade sustentável no contexto africano é necessário combater a inércia e a falta de vontade política para enfrentar os desafios da mudança. Com a implementação de boas práticas, ou seja, melhorar o engajamento político a favor de um desenvolvimento sustentável do transporte urbano, coordenado com as políticas de desenvolvimento económico e social, em diversas escalas de atuação. Na continuidade, importa que estas políticas incluam formas de monitorização e adequação constante aos desafios dos territórios, respondendo às necessidades das comunidades. O *continuum* urbano-rural destes territórios (africanos e sobretudo subsarianos) poderá configurar o crescimento demográfico e potenciar as áreas semidensas (OCDE, 2020). Na ótica da reprodução social, é imperioso reexaminar os padrões de mobilidade e as interações espaciais, já que tornam cada vez mais difícil discernir as relações entre produção do espaço e mobilidade, assumidas pelo capital. Depreende-se que o planeamento é configurado pelas interações espaciais ligadas à cidade e se relaciona com a conjuntura política, e económica (Silveira & Cocco, 2010; Aragão, 2014). O continente enfrenta múltiplos desafios para a mobilidade urbana, alguns estão listados na Figura 1.

Figura 1: Principais desafios para a promoção do transporte sustentável nas cidades africanas.

Neste contexto, as políticas de transporte em São Tomé e Luanda precisam abordar os desequilíbrios e reduzir as desigualdades sócio-territoriais, conciliando a demanda com a infraestrutura urbana atual, o inverso bloqueia os padrões comportamentais de mobilidade.

A REALIDADE SANTOMENSE E LUANDENSE

A presente reflexão sobre o modo de transporte informal em São Tomé e Luanda, propõe fomentar o debate sobre a regulamentação, para aplicação de uma cultura operacional de gestão, a fim de apontar caminhos sustentáveis e eficientes para o sistema de transporte local. O atual contributo reúne referências de mobilidade urbana e regulamentação de outros contextos geográficos, e contribuirá para desenvolver marcos teóricos, fomentar o conhecimento científico e cooperar com o diálogo académico, para a promoção de políticas urbanas mais justas e inclusivas.

Os transportes coletivos desempenham um papel fundamental no desenvolvimento dos territórios. Exigindo estratégias sustentáveis ao nível da infraestrutura e serviços em harmonia com o ordenamento do território. Assumem um papel estruturante na garantia do acesso aos recursos, promovendo, quando em presença de sistemas eficientes, maior justiça económica e social, particularmente nos países em desenvolvimento (Haggett, 1979; Cervero, 2001; Jacob, 2001; Mamani, 2004; Davis, 2006; Pieterse, 2010).

São múltiplos os fatores relacionados com a gestão da mobilidade, tais como a configuração das redes (incluindo a sua morfologia), os modos de transporte, qualidade de serviço, adequação, utilização, custos (para o utilizador e de serviço), tempos de deslocação, níveis de acessibilidade, conforto, conveniência, e segurança, entre outros (Reck, s. d.). A configuração do território e as suas estratégias de desenvolvimento comportam atenção diferenciada às redes e sistemas de transporte, permitindo assegurar às comunidades o acesso aos recursos (Costa, 2007; Barreto, 2019). Muitas vezes, e com especial incidência em países em desenvolvimento, as políticas públicas, as estratégias para o território e os transportes não são entendidas como fatores de integração, de melhoria da coesão social e valorização territorial.

Todavia, em São Tomé e Luanda, a ausência de uma devida regulamentação para o setor da mobilidade e gestão dos transportes, bem como a necessidade que a mobilidade territorial desempenha para as comunidades, fez emergir respostas informais, lideradas por interesses particulares. No entanto, é reconhecido que a regulamentação dos sistemas de transporte e a sua integração nas políticas de desenvolvimento territorial, contribuem para *"o suprimento de "falhas de mercado" (...), protegendo o bem público da Mobilidade Inclusiva, Eficiente e Sustentável, tendo em conta diferentes racionalidades"*, promovendo a qualidade do serviço público (AMT, 2018:5). Tendo como referência o Guia para a Elaboração de Planos de Mobilidade de Empresas e Pólos (Geradores e Atratores de Deslocações) de Portugal, adaptou-se a matriz para melhor compreensão dos contextos de estudo (Tabela 1).

Mediante as novas práticas de reprodução social, a atual desaceleração económica do mercado externo é estratégica para planear os investimentos privados e do sector público, tendo em vista a reestruturação dos territórios e a alavancagem de uma nova onda de crescimento, adequada à participação no mercado internacional.

		Na conquista do objetivo				
		ST	LDA		ST	LDA
Interna (organização)	**Pontos fortes**			**Pontos fracos**		
	Meios de transporte em bom estado	Não tem como prioridade		Gestão com muita interferência	Rotas definidas pela associação local	Tem autonomia própria
	Grande espaço de estacionamento	Organizada	Desorganizada	Falta de estratégias	Tem duras regras locais "acordo de cavalheiros"	Operam segundo mercado de escala
	Confiança dos órgãos do Governo para a implantação do programa	Mercado desregulamentado	Não é prioridade pelos que praticam	Falta de marketing	Não tem	
	Estar sediada na região onde opera	Sim		Flexibilização do horário	Não tem	
Externa (ambiente)	**Oportunidades**			**Ameaças**		
	Crescimento demográfico	Muito expressivo		Maior concorrência	Não tem	
	Atração de população (opção pelo autocarro em detrimento de transportes informais)	Não tem autocarro, única opção	A população tem preferência pelo candongueiro	Risco político da diminuição dos apoios concedidos ao sector.	Não tem apoios	
	Investimento estatal na melhoria das estradas.	Operam na informalidade		Aumento crescente do sector informal.	Mototaxis ganham relevância	Kupapatas e os girabairro ganham relevância
	Apoios do Governo ao desenvolvimento do sector transportador	Alheio às vontades e necessidades dos operadores de serviço		Morosidade na obtenção das licenças de exploração	Desregulamentado, mas operam com uma "licença" facultada pela associação	A maioria opera na informalidade
	Contribui para a redução da pressão sobre o estacionamento e o congestionamento	-	Nas áreas periféricas devido à subida à volutada dos combustíveis, é tido como um meio importante de locomoção	Debilidade das infraestruturas (as estradas que não estão asfaltadas, todas as empresas referem ser esta uma das maiores condicionante, sendo que este é um fator externo que os ultrapassa, porque é uma questão política do Governo, mas que afeta de grande modo as empresas, pondo em causa a durabilidade dos seus veículos	Fator comum	
	Permite aos trabalhadores descansar ou trabalhar durante a viagem	Transportes sem quaisquer condições		Face à expansão urbana, grande parte das zonas limítrofes da coroa central da cidade tem ruas que não estão asfaltadas, o que dificulta bastante a circulação das viaturas)	Fator comum: dificuldade de distribuição mais fina pelas artérias da cidade.	
	Diminui o stress associado à condução em horas de ponta	Principal modo de transporte, sem frequência ou cadência e expressivo congestionamento.				
	Diminui a poluição associada às deslocações casa / trabalho	Devido a ausência de horários e qualidade de serviço aumenta, estimula a utilização de				
	Contribui para a promoção da imagem de responsabilidade social e ambiental da empresa / polo, se uma percentagem significativa dos colaboradores utilizar o transporte público.	Ausência de políticas localmente				

Tabela 1: Análise de Pontos Fortes, Pontos Fracos, Oportunidade e Ameaça (SWOT) em São Tomé (ST) e Luanda (LDA).

Estas mudanças levam os governos a reestruturar as políticas urbanas[3], mais adequadas para responder às necessidades emergentes e incluindo preocupações relativas à redução da poluição e à oferta de melhores condições para o desenvolvimento económico e social.

Melhorar a acessibilidade é contribuir para criar oportunidades económicas e sociais, aumentar a eficiência do sistema de transporte público, com finalidade de criar cidades inclusivas, resilientes, sustentáveis e responsivas, concretizáveis com a implementação de um Plano de Mobilidade Urbana. É um "olhar" para a mobilidade como um atributo das cidades enquanto agregado de múltiplas decisões. Em São

[3] Relocalização das empresas, redes viárias de baixa distributividade usa a produção e o consumo, sucedendo a falência dos centros urbanos de maior dimensão.

Tomé e Luanda, assim como, na generalidade das cidades africanas, os transportes coletivos informais surgem como meio complementar ao sistema formal, em oposição a este, devido a "falha do Estado" ou mesmo 'desregulamentação'.

Estes territórios enfrentam múltiplos desafios, soluções embaçadas e acelerados ritmos de mudança, acompanhados com a complexidade das estruturas de governança e limitado conhecimento técnico. Os transportes coletivos informais confundem-se com o processo de estruturação da cidade. São um segmento que atua nas dinâmicas do território, imbricando novos eixos de crescimento em que é negligenciado a sua categorização como serviço de utilidade pública ou serviço público *stricto sensu*, promotor do crescimento de novas lógicas espaciais, analíticas e administrativas, centrais para a criação do instrumento de gestão e promoção de soluções (Cardoso, 1996; Mello, s.d.).

Para a promoção e unidade e coerência das ações desencadeadas de maneira isolada, sugere-se, a diferentes escalas, a promoção de um transporte urbano planeado e indutor equilibrado de desenvolvimento, sustentado entre o compromisso de *market rationality* e *social rationality*.

É importante uma abordagem integrada e coordenada a vários níveis, que ofereça diretrizes para a implementação de um sistema de gestão com resposta às comunidades. Implicando a adoção de medidas concretas de regulamentação adequadas aos recursos económicos existentes, no aproveitamento do sistema orgânico, dando-lhes condições para que assegurem o serviço público necessário ao desenvolvimento das comunidades (Aragão, 2014).

A REGULAMENTAÇÃO DO SETOR INFORMAL: SÃO TOMÉ E LUANDA

Na cidade de São Tomé o transporte coletivo informal é 'desregulamentado' contrariamente a Luanda, onde embora seja regulamentado, a maioria dos candongueiros[4] operam de modo informal. Na arena científica angolana, perdura o debate referente à denominação do candongueiro, enquanto modo transporte público ou privado. Devido às lacunas legais, a Lei de Bases dos Transportes Terrestres. em Angola, pelo decreto n.º 10 / 89, de 22 de abril, esclarece que,

> *"Os transportes públicos rodoviários podem ser explorados em regime de transporte regular ou ocasional. Sendo os primeiros os transportes efetuados segundo itinerários, paragens, horários e preços previamente definidos, e os segundos, os realizados sem carácter de regularidade, segundo itinerário, horário e preços que podem ser estabelecidos casuisticamente e de forma negociável e que capacidade global do veículo pode ser ou não posta a disposição de um só cliente" (cf. art. 12, n.º 2 e 3, do Regulamento de transporte de automóveis).*

[4] Denominação popular para o transporte coletivo informal em Angola.

Apesar da existência de uma Lei de Bases dos Transportes Terrestres em Angola com mais de 30 anos, ainda não foram implementadas as medidas definidas. Esta não implementação pode decorrer de lacunas que que dificultam a execução de regulamentação do transporte informal existente. Um transporte público comporta preços fixos, itinerário, paragens e horários, mais fáceis de gerir, enquanto um transporte informal, que preenche lacunas do transporte coletivo público sistematizado, não possui regularidade e depende, muitas vezes, das vontades do operador.

O jurista angolano José Domingos (2012) é controverso no esclarecimento dos candongueiros "serem transportes públicos ou privados". O assunto torna-se discutível por identificar lacunas na Lei de Bases dos Transportes Terrestres (art.º 12, n.º 1) e no Regulamento dos Transportes em Automóveis (art.º 3)[5]. O autor defende ser incorreto considerar candongueiros como transporte público coletivo, notando que são subsumíveis aos transportes em regime de aluguer, visto que o transportador tem livre-arbítrio sobre a escolha do itinerário. Os candongueiros operam no incumprimento da norma legal sectorial ou não se deve classificá-los como transporte público? Ainda que existam dificuldades de interpretação legal e dada a existência de linhas mestres que regulam o transporte automóvel, consideramos a definição da Direção Nacional de Transportes Rodoviários de Angola, que os designa como Transportes Públicos de Aluguer Coletivos Ocasionais.

O aparecimento dos candongueiros em Angola remonta à década de 1980. Devido à guerra civil (1975 - 2002) e consequente explosão demográfica de Luanda, as empresas que prestavam serviço de transporte público durante a época da guerra civil não conseguiam fazer face à procura, assim deixando livre o terreno para o surgimento de modos informais de prestação desse serviço. Até ao dia de hoje, os candongueiros têm desempenhando um importante papel no quotidiano dos cidadãos, cerca de 70% da população os utiliza como principal modo de locomoção (Domingos, 2012).

Em São Tomé, as políticas nacionais de transporte são descoordenadas e dissociadas do planeamento regional, não sendo assumidas como políticas públicas de forma evidente. A expansão da informalidade surge em função da falta de emprego, disponibilidade de renda e da oportunidade de negócio, sem que existam preocupações, nomeadamente resposta pública, no que respeita à qualidade do serviço, segurança e interesse coletivo. A situação, em termos práticos, é semelhante a Luanda (Panitz, 2006; Costa, 2007; Duarte et al., 2007; Delgado, 2014; Aragão, 2014). No entanto, em São Tomé, não existindo qualquer enquadramento legal para os transportes, os requisitos mínimos definidos para o transporte informal, são cumpridos com uma

[5] "Os transportes públicos só podem ser explorados em regime de transporte de aluguer ou de transporte coletivo (…) são os de aluguer os transportes em que os veículos são alugados no conjunto da sua lotação ou da sua carga e postos ao exclusivo serviço de uma só entidade segundo itinerário da sua escolha (…), são coletivos os transportes em que os veículos se utilizam por lugar da sua lotação ou por fracção da sua carga, segundo itinerário e horário devidamente aprovados, podendo servir a quaisquer pessoas, sem ficar exclusivamente ao serviço de nenhuma delas" (Domingos, 2012: 29).

auto-regulação por parte da Associação de Taxistas[6], o que demonstra a utilidade da participação e envolvimento das comunidades na resolução dos problemas e na definição de soluções.

A regulamentação do transporte coletivo informal nas cidades africanas é um tema complexo e relevante, entendido como problema de mercado (desregulamentado) ou como questão pública (princípios do interesse público/regulamentação). Os planos de mobilidade são uma conceção avançada de planeamento, do desenvolvimento económico e institucional. Enquanto instrumentos gerenciadores de projetos e investimentos em vários sectores, permitem estabelecer relações mais vincadas com a economia, a procura, infraestrutura e a eficiência de toda a ordem (Panitz, 2006). Como documentos estratégicos, operacionais, de atuação e sensibilização, contribuem para promover diferentes modos de transporte e para implementar um sistema integrado de mobilidade, minimizando os custos de investimento e de exploração, reduzindo os impactes económicos, sociais e ambientais provocados pelas deslocações diárias (Aragão, 2014). Assim sendo, considera-se que os planos de mobilidade devam contemplar os seguintes princípios:

I. Orientar as prioridades dos investimentos locais;

II. Coordenar as ações dos sectores público e privado, com o objetivo de garantir a transparência da administração pública e a participação da sociedade na gestão da província;

III. Compatibilizar os interesses coletivos;

IV. Reduzir o número de deslocações (em especial as realizadas em modo motorizado individual);

V. Privilegiar medidas que fomentem a sustentabilidade do sistema de transportes e protejam o ambiente, integrando preocupações como a eficiência energética e económica, a segurança e a equidade social;

VI. Promover a transferência modal para modos de transporte mais eficientes;

VII. Promover políticas integradas de transporte que favoreçam não só as deslocações em transporte público, como também noutros modos alternativos, como o pedonal e o ciclável.

VIII. O envolvimento político de todos os atores é relevante para a organização do sistema de transporte.

O consecutivo erro observado nas cidades africanas poderá estar relacionado com a dependência de consultoria externa pela inexistência, ou não envolvimento, de técnicos locais. Importa ter o *know-how* local, envolvendo as empresas do ramo, *stakeholders*, sociedade civil e órgãos da administração pública, para que as opções

[6] Denominação do transporte coletivo informal em São Tomé e Príncipe. A associação é uma organização da sociedade civil sectorizada, tendo a finalidade de promover a deslocação da população de modo organizado. Apesar da informalidade da atuação, estabelece regras de convivência e operacionais, garantindo que seus direitos e deveres sejam cumpridos.

tomadas se adequem às tipologias das necessidades e condicionantes locais (hábitos e costumes). Em síntese, a participação pública é um fator determinante para o sucesso da realização do plano. A elaboração do plano é uma responsabilidade social de toda a coletividade e configura-se como uma obrigação do Estado. Para tal deve seguir uma estrutura e uma composição básica para que as estratégias de acompanhamento dos planos possam ser efetivas e propiciadoras de soluções adequadas e ajustadas, a cada momento, às necessidades (Tabela 2).

Estruturas	Função	Composição
Comissão executiva	Definir os objetivos que presidem à elaboração do plano; Acompanhar e validar todos os trabalhos desenvolvidos e resultados obtidos; Participar na elaboração do plano de ação; Incentivar a implementação do plano.	Gestão de topo das empresas polos (elementos do Conselho de Administração, responsáveis financeiros e de recursos humanos, outros órgãos de direção).
Equipa técnica do plano	Elaborar e implementar o plano e proceder à divulgação periódica dos resultados da monitorização	Técnicos da empresa / polo, consultores externos
Colaboradores	Acompanhar a elaboração do plano; Participar na elaboração do plano de ação.	Colaboradores / grupos-alvo / painéis de auscultação
Comissão de acompanhamento	Acompanhar e validar todo o processo de elaboração e implementação, transmitindo experiência, emitindo pareceres sobre os trabalhos desenvolvidos, facultando informação e	Representantes da gestão de topo; Representantes dos colaboradores; Representantes dos grupos–alvo (visitantes, fornecedores); Entidades externas
Outras entidades	Acompanhar e validar todo o processo de elaboração e implementação, transmitindo experiência, emitindo pareceres sobre os trabalhos	Governos Provinciais; Administrações municipais; Administração local, operadores de transportes e outras.

Tabela 2: Propostas de estruturas a criar para acompanhamento do plano de mobilidade e gestão e sua composição (Aragão, 2014:109)

A elaboração do plano é um cíclico e dinâmico exercício de ajustamento, possibilitando aos órgãos de decisão a aplicação de políticas com elevado índice de acertos e grande rendimento. O que permite "*a montagem expedita de cenários sócio económicos alternativos, que poderão servir de base, (…) [ao] aperfeiçoamento de uma política de transporte multimodal, com a implementação de nós intermodais à rede básica*" (Panitz, 2006: 118).

Em vários contextos, a implementação dos planos de mobilidade originou novos modos de deslocação e uma procura maciça por transportes públicos. Em Luanda, apesar do esforço do governo, as medidas tomadas, quer por ausência de planificação, quer por desajuste face à realidade (inadequação) estimulam o uso do transporte individual.

Na cidade de São Tomé, o plano de mobilidade é inexistente e não é tido como eixo prioritário. A Lei-Quadro das Autarquias Locais (2015) de São Tomé e Príncipe, prevê a *"Criação e manutenção de rede viária e transportes rodoviários coletivos"*, enquanto a Constituição do País define garanta, no art.° 33, que "*A todos os cidadãos é garantido o direito de se deslocarem e fixarem livremente em qualquer parte do território nacional"*. Assim, mantem-se o apoio a um sistema que permite o estímulo ao transporte individual, a manutenção de serviços informais sem enquadramento, a que se junta a ausência de infraestruturas. Esta situação tem de ser revertida com a maior brevidade já que a promoção da utilização de transportes públicos, com elevados níveis de satisfação dos utilizadores, tem um importante valor estratégico, sendo um dos aspetos que melhor ilustram a boa qualidade de vida e a estabilidade social (Aragão, 2014). Nesta sequência, achou-se relevante fazer o paralelismo entre algumas linhas de orientação propostas no "Guia de Elaboração de Planos de Mobilidade e Transporte" (2011) de Portugal (Tabela 3), e as estratégias recentes de organização do sistema de transportes em Luanda e as propostas para cidade de São Tomé (Tabela 4).

Guia de Elaboração de Planos de Mobilidade e Transporte
1 — Definir e garantir os níveis adequados de acessibilidade oferecidos pelo sistema de transporte a todo o cidadão
Assegurar que todo o sistema de transporte seja estendido a todo o território.
2 — Estabelecer uma configuração eficiente do sistema de acessibilidades
Procurar soluções, tirando partido dos diversos modos de transporte, adaptando-as ao contexto urbano, sendo esses modos diferenciados consoante as densidades e os volumes da procura (desenho adequado do sistema de transporte, nomeadamente rede de TP e infraestruturas).
3 — Sustentação económica como garantia da estabilidade da oferta
O sistema de mobilidade deve contribuir para uma alocação racional de recursos financeiros, o que depende:a) Do modelo global de financiamento; b)Do orçamento de exploração, cujas contas devem ser equilibradas (distinguindo o serviço público do apoio social); c)De fontes de receita geradas pelo sistema de mobilidade, que devem ser diferenciadas.
4 — Melhorar a qualidade de vida do cidadão pela redução dos impactes negativos (sociais, ambientais e económicos) da mobilidade
a)Assegurar uma redução do volume de utilização do transporte individual; b)Redução dos custos de externalidades para pessoas, organizações e sociedade em geral, decorrentes do congestionamento, através da promoção de uma diversidade de soluções; c)Uso de modos mais limpos e mais seguros; d)Assegurar tecnologias de transporte e soluções mais eficientes na infraestrutura, em cada modo e na articulação entres estes.
5 — Criar boas condições para modos não motorizados, particularmente para o peão
É importante promover a existência de boas condições para a circulação de peões e ciclistas, já que é desejável ter um sistema urbano mais eficiente, com maior acessibilidade de proximidade e com menos emissões nocivas.
6 — Promover um uso racional dos modos individuais motorizados
a)Desenvolver redes rodoviárias hierarquizadas, que contribuam para a redução dos impactes do tráfego na qualidade de vida da população urbana; b)Promover a transferência modal para modos mais sustentáveis, nas deslocações de curta / média distância.
7 — Assegurar serviços públicos de boa qualidade e com características técnicas adequadas à procura
Conciliar eficiência e equidade implica a disponibilização de soluções de transporte público a preços acessíveis e com boa cobertura no espaço e no tempo, considerando soluções de transporte variáveis e adaptadas aos níveis de densidade da procura, períodos horários ou dias de semana.
8 — Integração das políticas de uso do solo e de transporte
a)Garantir serviços adequados competitivos de transporte público aos principais polos atractores / geradores de deslocação e integração desses polos no tecido urbano e rede de modos suaves; b)Desenvolvimento de soluções urbanas compactas e aposta na diversidade e complementaridade das funções urbanas, de modo a favorecer a mobilidade; c) Garantir através do desenho urbano uma boa legibilidade das redes.
9 — Promover a integração física (funcionalidade de interface), tarifária (utilização do mesmo título de transporte), lógica (informação e integração de horários) e institucional dos diferentes componentes do sistema de mobilidade
Garantir a existência de um sistema multimodal de mobilidade, em que os utilizadores de vários modos de transporte não sejam penalizados pela falta de integração entre os mesmos.
10 — Assegurar a participação pública nos processos de decisão associados à mobilidade
Esta orientação permite assegurar que a política seja desenvolvida de forma transparente e participativa, permitindo intensificar as ações de educação, formação e sensibilização para uma nova cultura de mobilidade.

Tabela 3: Guia de Elaboração de Planos de Mobilidade e Transporte em Portugal (2010; IMTT, 2011; Aragão, 2014)

Estratégias, propostas e lacunas na organização do sistema de transportes em LDA vs STP
1— Definir e garantir os níveis adequados de acessibilidade oferecidos pelo sistema de transporte a todo o cidadão
Luanda: a) Os planos privilegiam trajetos ao longo e nas artérias principais, omitindo os musseques, que têm uma elevada densidade populacional; b) Os candongueiros têm acompanhado a expansão do território, conhecedores da procura, (bacias de emprego, serviços, equipamentos públicos, etc.). Quando se transpõem a informações para os planos de transporte, apesar dos candongueiros serem o principal modo de deslocação da população, são praticamente "excluídos", dando-lhes pouca relevância. **São Tomé**: a) Os táxis circulam aos longo das artérias principais de modo organizado, excluindo os musseques (bairros de construção precária e suburbanos), que têm uma elevada densidade populacional b) O táxi não tem autonomia para executar um percurso, são orientados segundo uma associação local de taxistas; c) Os táxis não acompanham a expansão do território.
2 — Estabelecer uma configuração eficiente do sistema de acessibilidades
Luanda: a) Ausência de estratégia integradora entre operadoras e linhas de exploração; b) Ineficácia do Estado no controlo dos candongueiros; d) Ausência de iniciativa inclusivas no processo de planeamento. Os estudos preveem que estes operem apenas nas zonas alimentadoras, ou seja, uma estrutura suplementar ao autocarro, na zona externa do casco urbano, transferindo-os para os bairros. **São Tomé**: a) Apesar de ser o único modo de transporte público nacional, não existe um enquadramento legal, tornando-os excluídos do processo de planeamento e ordenamento urbano.
3— Sustentação económica como garantia da estabilidade da oferta
Luanda: O tarifário é estipulado pelo Governo, poem em causa o desenvolvimento operacional e de exploração. Contudo, devido à ausência de fiscalização os candongueiros praticam as suas rotas e valores, encarecendo a deslocação do usuário. **São Tomé**: a) O Preço do bilhete é fixo e estipulado pelo Governo apesar da informalidade do modo de transporte.
4 — Melhorar a qualidade de vida do cidadão pela redução dos impactes negativos (sociais, ambientais e económicos) da mobilidade
Recomenda-se que territórios em estudos criem soluções que condicionem o uso de transporte individual, nomeadamente: (i) aumentar o preço do combustível; (ii) desenhar e implementar políticas de incentivo às empresas para os funcionários se deslocarem de transporte coletivo; (iii) aumentar a fiscalização ao incumprimento das normas legais de circulação automóvel (taxas de circulação, seguro e selo); (iv) melhorar a integração entre os diversos modos de Transporte publico coletivo; (v) assegurar a qualidade dos transportes coletivos; (vi) criar estímulos à população de modo a utilizarem o transporte coletivo (acesso ao wi-fi no autocarro, por exemplo); (vii) criar attraction inequalities(diversidade de funções no mesmo espaço, de modo a misturar usos e aumentar a densidade popualcional); (viii) conceção e implementação de um sistema de passe social. **Luanda**: a) Prevê-se a implementação do BRT (bus rapid transit), tem capacidade de transporte e qualidade de desempenho semelhantes a um metropolitano, com maior simplicidade e menos dispendioso. Para conseguir a modalidade de circulação desejada deverá ter faixas de circulação exclusivas. Numa fase inicial, dependerá de um sistema integrado de transporte público b) Os planos contemplam diversas soluções de mobilidade e interface, não restringe o uso de transporte individual.
5— Criar boas condições para modos não motorizados, particularmente para o peão
Os modos suaves são culturais nas cidades africanas, todavia não é acauteladas as condições que propiciam a prática nos dois territórios.
6 — Promover um uso racional dos modos individuais motorizados
Luanda: a) Os planos preveem redes modais integradas hierarquizadas de acordo com o potencial de mobilidade associado à expansão da cidade; b) Inexistência de divulgação dos custos reais de utilização do transporte individual (deseconomias).
7 — Assegurar serviços públicos de boa qualidade e com características técnicas adequadas à procura
Em **Luanda** os planos preveem medidas de modo a solucionar o congestionamento das vias, sendo que este é um dos grandes entraves à operação dos autocarros, os quais, apesar dos esforços, não conseguem cumprir horários nem serviços regulares.
8 — Integração das políticas de uso do solo e de transporte
Luanda os planos preveem a legibilidade das redes através do desenho urbano, através da estruturação adequada, da hierarquizada das vias e da sua sinalização. Em **São Tomé** a inexistência de plano origina: (i) Dificuldades de gestão de tráfego (congestionamento); (ii) Dificuldade de estacionamento; (iii) Impactes ambientais; (iv) Sinistralidade; (v) Dificuldades criadas ao movimento pedonal; (vi) Sobrelotação de transportes públicos nas horas de ponta (vii) Inadequação da oferta de transportes públicos fora da hora de ponta; (viii) Efeitos negativos sobre a produtividade dos trabalhadores; (ix) Expansão urbana descontrolada; (x) Exclusão social; (xi) Perda de competitividade das cidades; (xii) Desincentivo do uso de transportes públicos.
9— Promover a integração física (funcionalidade de interface), tarifária (utilização do mesmo título de transporte), lógica (informação e integração de horários) e institucional dos diferentes componentes do sistema de mobilidade
Em **Luanda** está em curso a implementação Programa Bilhética, consiste na aquisição de um bilhete eletrónico, com a finalidade de controlo das vendas e da subvenção do bilhete para autocarros. **São Tomé** e **Luanda** a inexistência de um passe único, encarece a circulação do utente, penalizado pela multimodalidade.
10 — Assegurar a participação pública nos processos de decisão associados à mobilidade
Em **São Tomé** as rotas são definidas pela Associação de Taxistas

Tabela 4: Sistematização das orientações e estratégias para organização do Sistema de Transportes em Luanda e São Tomé. (Costa,1992; IPEA & ANTP, 1999; Machado, 2010; IMTT, 2011; Aragão, 2014)

Nos territórios em estudo, a interdependência dos fatores que afetam a formulação de políticas de transportes e a ações de intervenção individualizada, agudizam a problemática (Thomson, 1977). A clara inexistência de referências concretas à regulamentação do transporte informal, numa visão de passagem a um efetivo serviço público, estimula que se efetue uma análise integrada da situação existente, na valorização das sinergias do transporte informal, devidamente coordenado com os interesses e necessidades das comunidades (Dimitriou,1992; Cardoso, 1996; Cardoso, 2004; Vasconcellos, 2012; Campos, 2013; Aragão, 2014; Aragão, 2019).

A restrita circulação pelas cidades, decorrente da pandemia, afetou de modo significativo a população economicamente mais vulnerável. Deste modo, recomenda-se que a mobilidade urbana seja também uma ferramenta de justiça social para colmatar desigualdades estruturais. A limitação e a alteração de hábitos, evidenciou que as políticas de mobilidade são fundamentais para uma nova equação do futuro das cidades. Pelo que, na formulação dos planos de mobilidade e gestão convém adotar uma abordagem integrada, inclusiva e aberta do problema, assente em princípios de sustentabilidade e da ciência cidadã para a inovação social. Um sistema bem organizado gera sinergias que contribuem para integrar todos os atores no âmbito

da promoção do desenvolvimento local. Partindo da suposição de que a mobilidade é um direito fundamental, elencaram-se as boas práticas de planeamento de transportes urbanos noutras realidades africanas, ampliando a discussão sobre o sector no contexto regional (Tabela 5).

Cidades	Problema	Solução
Conseil Executif Des Transports-CETUD, Dacar, Senegal	— Setor informal dominante (mais de 1200 de car rapides / ndiaga nidaye (TCI); — Representava 4% dos problemas do sistema de transporte; — Cada operador possuía 1 a 4 veículos; — Veículos com idade média de 28 anos, por limitações financeiras para substituição.	— 1997 quando se dá a criação de um órgão com poderes executivos para coordenar os transportes - conseil executif des transports (CETUD); — Em 2001, 446 operadores foram reagrupados em 13 cooperativas (grupo de interesse económico para prestação de serviço de transporte em serviço de franquia; — O modelo é apoiado pelo Banco Mundial, que criou condições financeiras preferenciais aos operadores, que espacialmente traduziu-se em substituição gradativa da frota. A entidade financeira teve taxa de recuperação de 99% em um período de 5 anos. — Domínio de transporte caiu de 95% para 66%, possibilitando que o transporte publico (autocarro) aumentasse a sua participação no mercado de 3% para 13%; — Criação do Plano de Mobilidade de Dacar, que contempla tarifas, rotas e informação para os passageiros; — Com a redução do número de operadores, implementou-se um plano integrado eficaz e eficiente. — Os operadores passaram a ser remunerados e especializados (formação).
Rea Vaya, Joanesburgo, África do Sul	— Cidade de maior densidade populacional da África do Sul; — A maioria dos usuários percorria longas distâncias, utilizando como único modo de transporte os micro-ónibus ou táxi motorizado, para atividades primárias nomeadamente o trabalho. Ponha em causa a acessibilidade do território; — Necessidade de um transporte em massa para de fazer face às imposições do grande evento internacional de desporto a FIFA 2010.	— Sistema de BRT substituiu 1100 veículos de m micro-ónibus em um corredor de 25 km; — Os operadores privados foram contratados para alimentar a "rede" - distribuição mais fina da cidade; — Melhor qualidade dos serviços; — Fortalecimento na atuação do governo com a monotorização da rede de transporte, agora integrada com o uso do solo; — Melhores condições de trabalho para motoristas; — Criação de 700 postos de emprego direto na 1ª fase do projeto 3300 temporários durante o período de construção.
BRT Lite, Lagos, Nigéria	— Corredor de 22km com constante congestionamento; — Necessidade de transportar 200 000 passageiros/dia	— Implementação do BRT; — Consumo de combustível caiu 35% ao longo do corredor, ou seja, redução anual de 25 000 toneladas de CO2; — Criação de órgão institucional e quadro regulatório, que incluía sindicatos locais e proprietários dos carros que já serviam as rotas; — Criação colaborativa de rotas fraqueadas; — Forte campanha de marketing; — Incentivo fiscal – 30% na redução da tarifa em relação ao transporte informal e 35% de desconto consoante o tempo de viagem.

Tabela 5: Exemplo de Boas Práticas Africanas (UN-HABITAT & UITP, 2010)

O transporte e a mobilidade urbana são os elementos fulcrais para o desenvolvimento socioeconómico das cidades africanas. O sector informal, sem qualquer perspetiva de futuro, ainda que represente a maioria dos operadores do sistema de transporte do continente, fragiliza o progresso das sociedades e um acesso justo, qualificado e universal do território, desiderato incluído nas constituições dos países em análise.

CONCLUSÃO

Apesar de realidades geográficas distintas, a regulamentação dos transportes coletivos informais em São Tomé e Luanda é um tema complexo, de cariz público embora entendido como problema de mercado e sem controlo (princípios do interesse público/regulamentação). Na definição e desenvolvimento futuro dos modelos que permitam regulamentar o setor, através de um sistema de gestão que assegure um sistema público e universal de transporte coletivo com qualidade e de serviço às comunidades, interessará considerar os seguintes objetivos específicos:

a) Desafio energético;

b) Planeamento integrado da mobilidade;
c) Confiabilidade do sistema (opções multimodais);
d) Planeamento orientado para o desenvolvimento das cidades, resulta em investimento mãos assertivos e eficazes - gestão da demanda;
e) Crescimento económico - Investimentos e criação de emprego (os efeitos multiplicadores a cada emprego direto resulta em 2,5 empregos indiretos no setor);
f) Investimento em transporte sustentável e oportunidade para a economia verde é a velha máxima *"agir localmente e pensar globalmente"*;
g) Implementação de transporte inteligente;

Para alcançar os objetivos descritos, implica:
a) Vontade política em ações coordenadas;
b) Identificar, compreender e aprender com os sistemas de transporte e mobilidade, a sua regulamentação e estratégias nos países africanos em desenvolvimento, considerando os fatores económicos, hegemonia cultural e sociais;
c) Compreender os impactes do sistema de transporte informal no território e seus efeitos na produção dos padrões de uso do solo, de mobilidade urbana e acessibilidade;
d) Estabelecer critérios de avaliação do serviço, a partir da relação entre os indicadores de mobilidade e de acessibilidade, com o objetivo de propor diretrizes para a regulamentação, assente num sistema de gestão eficiente, que transforme o transporte coletivo informal num serviço público de qualidade.

Os objetivos e ações supracitadas terão maior sucesso com a inclusão de medidas concretas de participação das comunidades, quer na definição dos problemas, quer na indicação de soluções, implicando a adoção de metodologias de proximidade, recorrendo à colaboração, também como forma de educação para o uso do território e respeito pelo bem comum. A regulamentação dos transportes coletivos informais deve ser promovida com a participação ativa de atores e agentes, tendendo a uma adoção de meios de deslocação mais eficientes, menos poluentes e que assegurem o bem-estar das comunidades que servem.

A compreensão do uso do território e das diversas dinâmicas do sistema de transporte coletivo informal nas sociedades africanas poderá possibilitar a criação de um paradigma de gestão de transporte assente em políticas/estratégicas integradas. Um paradigma que impulsione níveis eficientes de serviço, com qualidade, promovendo maior justiça e equidade social em São Tomé e Luanda, e as cidades envolventes, rompendo com o marco tradicional, tendo como atual protagonista a mobilidade sustentável.

As futuras pesquisas sobre estes territórios, deverão permitir consolidar medidas para a promoção da mobilidade e acessibilidade oferecidas aos cidadãos, devendo estas estarem assentes em políticas territoriais, onde se incluem fatores de coesão e complementaridade de funções, fortalecendo o território para permitir às comunidades o acesso aos recursos e o seu uso eficiente e sustentável. O planeamento

integrado, contribui para fomentar um processo de formulação de política pública e de tomada de decisão na operacionalização do sistema de transporte, bem como dos seus impactes nos processos de ocupação do solo.

Recomenda-se a utilização de metodologias participativas, geoespacializadas, de *crowdsourcing*, estimulando a envolvência das pessoas no processo de cocriação do plano de gestão e mobilidade. Metodologias enquadradas com as recomendações internacionais, nomeadamente das Nações Unidas, que visam o cumprimento dos Objetivos para o Milénio. A fim de, comunidades mais adaptadas aos desafios com capacidade de utilizar os territórios de forma sustentável o que implica aceder aos recursos, bens e serviços que permitem a vida qualificada das comunidades.

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Instrumentos normativos para o ordenamento do território e urbanismo em Cabo Verde. Uma análise a partir de um circuito mais pertinente de intervenção

Normative instruments for land and urban planning in Cape Verde. An analysis from a more pertinent intervention path

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Resumo - *O sistema de gestão territorial revela desfasamento em relação à prática dos agentes e às marcas no território. O desrespeito pelas normas legalmente gizadas, a par de falhas de articulação e coordenação e de deficiente envolvimento público, tem contribuído para o agravamento das situações. Para vencer a causa do ordenamento do território, é necessário o envolvimento do sector privado e das populações. E isto passa por uma governança colaborativa que mobilize recursos e estimule a participação, ao mesmo tempo que esclarece direitos e deveres. Só desta forma é possível criar verdadeiros projetos transformativos. A nível urbano, importa erguer e materializar uma política integrada de solos e de cidades, privilegiando a reabilitação e consolidação urbana. Na orla costeira, a estratégia deve contemplar um plano de ordenamento e programas de requalificação de áreas degradadas, e evitar a ocupação do domínio público marítimo. O turismo deve ser equacionado à luz da integração ambiental e sócio territorial. Ao mesmo tempo, são necessários à salvaguarda efetiva das áreas protegidas e o ordenamento da atividade extrativa. O sistema de gestão territorial tem de ser adaptado à realidade do país. E é indispensável fortalecer as instituições com conhecimentos mais inovadores e ajustados aos desafios emergentes, bem como incrementar uma cultura cívica mais valorizadora do território. Este capítulo propõe uma reflexão sobre as oportunidades para estabelecer e definir as linhas orientadoras e estratégicas de intervenção para a elaboração do Instrumento Normativo de Ordenamento e Urbanismo ajustado à realidade de Cabo Verde e da Cidade do Tarrafal de Santiago, em particular, através de análise/estudos relativos à cidade.*

Palavras-Chave - Cabo Verde, ordenamento do território, planeamento, urbanismo, instrumentos

Abstract - *The land use planning system reveals gaps in the practice and consequences on the territory. The failure to observe legally established norms and standards, failings in cooperation and coordination of activities, and a lack of public involvement are factors that lead to such a situation. To increase the effectiveness of spatial planning instruments, the involvement of the private sector and citizens is crucial, and this requires a collaborative governance that, while mobilizing resources and clarifying rights and duties, also encourages participation. The territorial management system has to be better tailored to the country's reality. This makes it crucial to advance innovative and place-based knowledge, to tackle emerging challenges, as well as foster a civic culture that values the territory. This chapter proposes a reflection on how to establish and define strategic guidelines towards a planning normative more adapted to reality in Cape Verde, in general, and to the city of Tarrafal de Santiago, in particular.*

Keywords - Cape Verde, spatial planning, land use planning, urban planning, planning Instruments

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INTRODUÇÃO

Cabo Verde foi descoberto e colonizado por Portugal, entre 1460 e 1974. O ano de 1974, marcou uma fase crucial do processo de descolonização, pois, nesse ano foi constituído o Governo de Transição consignado na lei n°13/74, de 17 de dezembro de 1974 que aprovou o Estatuto Orgânico do Estado de Cabo Verde (EOECV). Em 30 de junho de 1975[1] foi a data deliberada para uma eleição por sufrágio direto e universal em que resultou na primeira assembleia representativa do povo de Cabo Verde, dotada de poderes soberanos constituintes, com a função de declarar a independência do Estado de Cabo Verde e elaborar a futura constituição política desse Estado. O ato da declaração oficial da independência do Estado de Cabo Verde coincidiu com o da investidura dos representantes eleitos do povo de Cabo Verde e ter lugar na cidade da Praia, e com a presença do Presidente da República Portuguesa[2] em 5 de julho de 1975, para o efeito da assinatura do instrumento solene da transferência total e definitiva da soberania para um Estado independente. (Silva, 2020: 16-17, 375).

A previsão no ordenamento jurídico e institucional Cabo-Verdiana de instrumentos de efetivação da política pública próprios e adequados para que os municípios contribuam com o desenvolvimento urbano está intimamente ligada ao processo histórico de construção de uma política urbana colonial, com todas as suas contradições.

LEI DO SOLO ANTES DA INDEPENDÊNCIA

Nas vésperas da Independência Nacional de Cabo Verde foi publicado no Diário do Governo Português o Decreto-Lei 576/70, de 24 de novembro de 1970 que se deu precisamente o nome de Lei dos Solos, tornado extensivo a Cabo Verde pela Portaria nº. 421/72, de 1 de agosto, mas a lei que verdadeiramente disciplina o solo em atenção à definição e fixação de domínios é o Regulamento de Ocupação e Concessão de Terrenos nas Províncias Ultramarinas, aprovado pelo Decreto nº. 43 894, de 6 de setembro de 1961, tornado extensivo a Cabo Verde pela Portaria nº. 24 229, de 9 de agosto de 1969[3].

LEI DE SOLOS APÓS A INDEPENDÊNCIA

Com a proclamação da independência de Cabo Verde, houve um forte fenómeno de migração das zonas rurais para o centro da Cidade, à procura das melhores condições de vida, como por exemplo: melhor acesso de comunicação; oportuni-

[1] Cfr. art. 10º e 11º, ambos, do acordo de independência celebrado entre o governo português e o PAIGC, no dia 19 de Dezembro de 1974, bem como, o art.º 31º n.ºs 1 e 2 do EOECV, instrumento esse decretado pelo Conselho do Estado português de então e promulgado como lei constitucional.

[2] Nesse ato, o Presidente da República fez-se representar pelo Primeiro-Ministro do Governo Provisório de Portugal, Vasco Gonçalves, conforme consta do instrumento solene da declaração da independência de Cabo Verde.

[3] I Série - nº 54 sup. B.O. da República de Cabo Verde - 19 de julho de 2007.

dade das infraestruturas bases; equipamentos coletivos; emprego e melhor condição de desenvolvimento intelectual, por estas razões o governo sentiu-se uma necessidade urgente de normas adequadas e atualizadas para a gestão do território. Através do Decreto-Legislativo nº 1/2006 de 13 de fevereiro de 2006[4], foram aprovadas as Leis de Bases do Ordenamento do Território e Planeamento Urbanístico (LBOTPU), com o intuito de ordenar e planear o território de forma que obedecem as normas gerais que norteiam as relações entre a Administração Central e o Poder Local; entre a Administração e os particulares; entre todos os agentes do desenvolvimento e o ambiente.

Uma Lei de Solos que definia a política dos solos, instituída pela Presidência do Conselho e Ministério do Ultramar português, mas fora da realidade territorial cabo-verdiano, mostrava-se desadequada nos planos terminológico, institucional e regulamentar. Com efeito, a lei utilizava terminologia desadequada, reportava os institutos, serviços e instituições caídos em desuso ou que simplesmente já tinham desaparecidos da ordem jurídica cabo-verdiana. No plano institucional, não se adequava com a organização administrativa recém-criada, registando mesmo situações de incongruência no domínio regulamentar. Assim, foram trazidas por um projeto de diploma legal em matéria de solos, alterações significativas, através do Decreto-Legislativo nº. 2/2007, de 19 de julho de 2007, que igualmente revogou expressamente, o Regulamento de Ocupação e Concessão de Terrenos, aprovado pelo Decreto nº 43 894, de 6 de setembro de 1961, e a denominada lei de solos aprovada pelo Decreto-Lei nº 576/70, de 24 de novembro, mandado vigorar em Cabo Verde pela Portaria no 421/72, de 1 de agosto e tornado extensivo a Cabo Verde pela Portaria nº24 229, de 9 de agosto de 1969, os respetivos diplomas complementares e demais legislações em contrário. A preocupação principal da nova Lei de Solos é a do estabelecimento de domínios. Ela regulamenta a terra do ponto de vista do controlo, fazendo concorrer o domínio alienável e inalienável do Estado e das Autarquias locais com o domínio privado dos administrados. Neste particular, a Lei de Solos estabelece a ponte com o regime jurídico da propriedade privada e a disciplina jurídica de outras formas de ocupação e utilização do território.

No ano 2008 o Governo demonstrou a preocupação de promover um desenvolvimento mais acelerado, integrado e planeado; fatores que foram determinantes para a elaboração dos Esquemas Regionais do Ordenamento do Território (EROTs; Resolução nº 39/2008 de 24 de novembro de 2008) respetivamente para as ilhas de Santiago, Fogo e Santo Antão, através da Direção Geral do Ordenamento do Território e Habitação, o serviço central do Ministério da Descentralização, Habitação

[4] Cumpre esclarecer que, desde a sua entrada em vigor até a presente data, o Decreto-Legislativo nº 1/2006 de 13 de fevereiro de 2006, passou por duas importantes revisões, sendo a primeira revisão, a mais profunda, foi levada a cabo pelo Decreto-Legislativo n.º 6/2010 de 21 de Junho, com vista a corrigir um conjunto de incongruências, lacunas, erros e conceitos indevidamente utilizados, identificadas no processo de elaboração e socialização de RNOTPU, enquanto que a segunda revisão, a mais ligeira, foi levada a cabo pelo Decreto-Legislativo n.º 4/2018 de 06 de julho, com o propósito adequá-la à realização dos objetivos tidos em vista e que iam de encontro ao programa do governo.

e Ordenamento do Território. Esse diploma foi desenvolvido a partir de seis eixos estratégicos: Desenvolver e consolidar rede das cidades; Valorizar o território rural e desenvolvimento da centralidades intermédias; Alargar a mobilidade territorial; Integrar territorialmente o turismo; Valorizar os espaços naturais e qualificar os espaços urbanos[5].

O PAPEL DO TURISMO NO PLANEAMENTO TERRITORIAL

Cabo Verde, desde a sua independência, elegeu o turismo como um dos seus principais eixos estratégicos de desenvolvimento. A partir de 1991, a estratégia para impulsionar o turismo foi sempre através das medidas e políticas de reforço da sustentabilidade do setor, nomeadamente a privatização de algumas unidades hoteleiras do estado, a regulação do setor e a criação de incentivos fiscais e aduaneiros para o investimento.

A definição do Plano Estratégico para o Desenvolvimento do Turismo em Cabo Verde 2010-2020 constituiu uma manifestação clara desta assunção por parte do poder público. O setor do turismo beneficia-se também de uma posição privilegiada nas opções de política económica. Os programas governamentais, ao propor um novo modelo de crescimento económico, atribuem ao turismo a função de pilar central da economia cabo-verdiana definindo, para este efeito, metas ambiciosas para o desenvolvimento do setor.

O esforço para a criação e aprimoramento de importantes instrumentos de planeamento, gestão e promoção turística, designadamente na delimitação das Zonas Turísticas Especiais (ZTE) em que estabelece o regime jurídico de declaração e funcionamento das Zonas de Desenvolvimento Turístico Integrado (ZDTI) e Zonas de Reserva e Proteção Turística (ZRPT), através do Lei nº 75/VII/2010 de 23 de agosto de 2010. As ZTE são áreas identificadas como possuidoras de especial aptidão e vocação para o turismo apoiado nas suas potencialidades endógenas ou com significativo potencial de futuro desenvolvimento turístico; ZDTI são áreas que possuem especial aptidão e vocação turística enquanto as ZRPT se tratam de áreas contíguas a uma Zona de Desenvolvimento Turístico Integral e dotadas de alto valor natural e paisagístico e cuja preservação seja necessária para assegurar a competitividade do produto turístico nacional, a curto e médio prazo.

A ZDTI é executada e gerida por dois instrumentos, o: - Plano de Ordenamento Turístico (POT) e o Plano de Ordenamento Detalhado (POD), que traduzem um compromisso recíproco de compatibilização com a diretiva nacional e os esquemas regionais de regulamento do território e prevalecem sobre os planos municipais e Plano de Ordenamento Detalhado (POD), cuja aprovação depende da aprovação do POT e pormenoriza as áreas de implantação de usos turísticos e os terrenos ocupados por equipamentos sociais e de lazer, podendo-se através dele efetuar

[5] I Série - nº 43 B.O. da República de Cabo Verde - 24 de novembro de 2008.

ordenamento dos volumes dedicáveis, reajustar e completar os sistemas viários, zonas de arborização, espaços livres e complementar as redes de serviços.

EVOLUÇÃO DA DIVISÃO ADMINISTRATIVA DE CABO VERDE

Na altura da independência existiam 14 concelhos, subdivididos em 31 freguesias. Posteriormente, como alguns desses concelhos foram sucessivamente subdivididos, Cabo Verde conta desde o ano de 2005 com 22 concelhos e 32 freguesias. No ano de 2010 houve a necessidade de determinar as categorias administrativas das povoações, nesse sentido através da Lei nº 77/VII/2010 de 23 de agosto de 2010, foi estabelecido o regime da divisão, designação e determinação das categorias administrativas das povoações, da seguinte forma: Cidade; Vila, Povoados e Bairros. Essa classificação foi determinada por um número mínimo de eleitores, equipamentos coletivos relevantes e por outro lado, a povoação ter alcançado um desenvolvimento comercial e/ ou industrial significativo.

CARTOGRAFIA TERRITORIAL

Depois da divisão administrativa, era necessário definir as regras/normas para a produção da cartografia territorial das cidades, no sentido de facilitar uma leitura mais realista e em curto período de tempo. Mapeamento foi eleito como instrumento capaz de garantir essa leitura do ordenamento territorial e este deve ser modulado no tempo, em função do enriquecimento do banco de dados e de informações e análises disponíveis a cada momento; permitir a elaboração de planos diretores de desenvolvimento sustentável com a caraterização sócio ambiental integrada; refletir sobre a ocupação demográfica e produtiva compatível com a capacidade de suporte dos recursos naturais e de acordo com seu estado de conservação; facilitar o desenvolvimento urbano com a identificação de vocações produtivas para os pequenos núcleos; permitir a efetiva implementação do cadastramento ecológico e económico que abriga a compreensão integrada e holística da realidade geografia, ambiental e socioeconómica do território.

Com o crescente processo de informação do século XXI, torna-se mais importante saber como aplicar os dados de uma forma prática. A cartografia torna-se um meio de compreender o espaço, para uma melhor gestão e junto com as técnicas de sistemas de informações que se ampliaram para uma melhor compreensão do espaço geográfico, assim sua interpretação se torna mais ágil, fácil e prática. Para isso era necessário a definição das normas para a representação desse através do mapa/ cartografia, sendo assim no mesmo ano o governo decretou por meio do Decreto-Lei nº 55/2010 de 6 de dezembro de 2010 e aprovada pelo Decreto regulamentar nº 14/2010 de 6 de dezembro de 2010, os princípios e as normas a que deve obedecer para a produção cartográfica no território nacional.

ESTATUTO DA CIDADE

Cidade do Tarrafal de Santiago aprovou o seu instrumento de gestão territorial à luz do Decreto-lei nº 85/IV/93 de 16 de julho de 2011. O Plano Diretor Municipal de Tarrafal de Santiago constitui o instrumento que regula e estabelece as opções em termos de uso, ocupação e transformação do território por ele abrangido, garantindo a execução das políticas e medidas de ordenamento do território de acordo com princípios específico e fins determinados na Lei de Base do Ordenamento do território e Planeamento Urbanístico (LBOTPU), Decreto-Legislativo nº1/2006, de 13 de Fevereiro, assim como no Regulamento Nacional de Ordenamento do Território e Planeamento Urbanístico (RNOTPU), aprovado pelo Decreto-Lei nº43/2010 de 27 de Setembro , que desenvolve e concretiza a LBOTPU.

No ano de 2011, o governo decidiu dotar todas as cidades de estatuto através do Decreto-Lei nº 15/2011 de 21 de fevereiro de 2011, que regula o Estatuto das Cidades e define as Orientações da política de capacitação dos espaços urbanos em Cabo Verde. A política de desenvolvimento urbano é ordenada pelos seguintes instrumentos:

- **Plano Diretor Municipal (PDM)** enquanto instrumento de ordenamento rege a organização espacial do território no âmbito municipal; e determina o parcelamento, a edificação, ou a utilização compulsória do solo urbano, não edificado, subutilizado ou não utilizado, fixando prazos e condições para tal. O Poder Público notificará o proprietário para cumprir a obrigação.

- **Plano Detalhado (PD)** enquanto instrumento de grau hierárquico superior, de natureza regulamentar, é objeto de uma profunda e detalhada análise técnica multidisciplinar e sempre deve estar em conformidade em termos de conteúdo material e documental e compatibilidade com outros instrumentos de gestão territorial existente.

POLÍTICA NACIONAL DE ORDENAMENTO DO TERRITÓRIO E URBANÍSTICO

O rápido crescimento, desenvolvimento e expansão das cidades e a preocupação de atualizar as cidades no contexto das alterações climáticas, são características marcantes do século XXI. Por estas razões, cada vez mais as cidades devem contar com políticas urbanas que extrapolam o limite cultural da cidade em causa.

Levando em conta que a Política Nacional de Ordenamento do Território e Urbanístico (PNOTU) é um instrumento de grande importância para qualquer cidade, e que desenvolvido sempre com outras partes interessadas, oferece a oportunidade de controlar a urbanização, ajuda a promover cidades produtivas, prósperas e mais sustentáveis. Cabo Verde aprovou através da Resolução nº24/2020, de 18 de fevereiro de 2020, a sua Política Nacional de Ordenamento do Território e Urbanismo (PNOTU), com os seguintes princípios orientadores: A equidade no acesso à cidade;

Equilíbrio territorial do sistema urbano e rural; Integridade na luta contra a pobreza e a desigualdade; Cuidado com o meio ambiente, resiliência e mudança climática; Oportunidades económicas para o desenvolvimento social e económico; e, por último, Governança democrática e participação social; e assente sobre os seguintes aspetos basilares: Governação e gestão territorial e urbana; Legislação territorial e urbana; Planeamento territorial e urbano; Gestão da terra; Finanças municipais e prosperidade das cidades; inclusão social e erradicação da pobreza nas cidades e sustentabilidade e resiliência territorial e urbana.

CONSIDERAÇÕES FINAIS

Com a análise dos instrumentos normativos para o desenvolvimento do território e urbanístico, e comparando com a aplicabilidade no território é percetível que Cabo Verde desde a independência, por um lado teve grande transformação territorial e urbanística e por outro lado, essa mesma transformação não foi bem orientada por parte das instituições e decisores com medidas e políticas de gestão. Muita das vezes por causa da ausência das mesmas o impacto a nível territorial é negativo. Consequentemente originou o desordenamento, desequilíbrio e falta de democracia territorial, e com isso uma implicação direta e de forma negativa na vida das pessoas.

A falta do Plano Detalhado incentivou a construção espontânea em massa, nos mais diversos pontos do território e com maior incidência nas ilhas mais desenvolvidas em termos económicos e oferta de oportunidades. Se tomarmos como exemplo a Cidade da Praia capital de Cabo Verde, pelo facto de ser capital encontram-se aqui concentradas a maioria dos equipamentos e serviços, por esta razão há a tendência da migração direcionada para esta parte do território que também oferece maiores oportunidades. A Cidade de Praia, consequentemente, evidência uma elevada concentração da população, de construções espontâneas, densidade habitacional e populacional de forma descontrolada, bairros informais e especulação imobiliária em todos os níveis sociais, enquanto, as ilhas e os territórios rurais deparam com grande erosão populacional.

Existem casos que a demora do poder municipal na elaboração dos planos e a atribuição dos lotes deixa as pessoas de poucos recursos económicos sem alternativas a não ser recorrer a ilegalidade para construção de uma moradia, enquanto por outro lado, algumas pessoas apropriam e sinalizam parte de terreno como se fosse lotes de terreno com a finalidade de especulação e posteriormente comercializá-las, de forma ilegal. A ausência do plano não permitiu que os responsáveis dos bairros sem meios para fazerem cumprir a legalidade, e a consequência é a construção espontânea em massa. Com uma análise mais detalhada e tendo em conta a falta de autoridade sobre os terrenos por parte da Câmara Municipal da Praia devido a não atuação de forma eficaz e eficiente, conduziu que as pessoas sentissem a liberdade de construírem como bem entenderem.

Com o fenómeno de construção espontânea e bairros informais os constrangimentos mais patentes são: Quarteirões densamente povoados, inexistência dos logradouros para ventilação correta nas habitações, e deficiente acessibilidade; Implantação de edifícios em lotes bastante desadequados, ausência do alinhamento das fachadas dos edifícios; (Silva, 2020).

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Programming the Logic of Space: A new approach to space syntax

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Abstract - *Space syntax is a set of theories and techniques for analysing urban settlements and buildings. It is a relevant approach for spatial studies concerned with the scientific understanding of and intervention in public open spaces. It requires a previous convex/line/segment map of the area in question designed with the aid of CAD or GIS. Such preparatory task may be laborious and more difficult for social researchers than for architects or urban planners. A new approach to syntactic analyses is proposed here; it requires only setting the connections between axial lines or convex spaces in a computer program. We performed a settlement (alpha) analysis of the Areeiro neighbourhood in Lisbon by computing connectivity, control, depth, integration, ringiness and other syntactic measures, using Prolog predicates. Prolog is a logic programming language used in Artificial Intelligence and a powerful tool to describe the patterns of urban systems as socially knowable due to its declarative nature. In fact, a Prolog program represents a certain amount of knowledge, in this case, of an urban settlement such Areeiro, which is used to answer queries about the social and economic consequences of the spatial design. This approach revealed the intelligibility but also the weaknesses of Areeiro, a remarkable milestone for Portuguese urbanism from the mid-20th century.*

Keywords - Space syntax, alpha-analysis of urban settlements, logic programming, Prolog

Resumo - *A sintaxe espacial (space syntax) é um conjunto de teorias e técnicas de análise do ambiente construído. É uma abordagem de base científica relevante para os estudos urbanos e para a intervenção no espaço público. Como passo prévio, as análises sintáticas requerem um mapa convexo, axial ou de segmentos desenhado com recurso a um sistema CAD ou SIG. Esta tarefa preparatória pode ser exigente ou difícil, nomeadamente, para investigadores das ciências sociais, sem formação em arquitetura ou urbanismo. Neste capítulo é proposta uma nova abordagem sintática que apenas requer a declaração, num programa de computador, das conexões entre linhas axiais ou espaços convexos. Desta forma, foi possível realizar uma análise do espaço urbano (análise alfa) do bairro do Areeiro, em Lisboa, mediante o cálculo de medidas sintáticas como a conectividade, o controlo, a profundidade, a integração ou o coeficiente anelar (ringiness) com recurso a Prolog, uma linguagem de Programação em Lógica utilizada em Inteligência Artificial. Fruto a sua natureza declarativa, a linguagem Prolog é uma poderosa ferramenta na descrição dos sistemas urbanos*

enquanto entidades socialmente cognoscíveis. De facto, um programa Prolog é um repositório (base) de conhecimento, por exemplo, sobre um espaço como o bairro do Areeiro que depois é utilizado para responder a questões concretas sobre as consequências sociais e económicas de determinado desenho urbano com recurso a lógica. Esta abordagem revelou a inteligibilidade, mas também os pontos fracos do Areeiro, uma realização, em todo o caso, notável do urbanismo português de meados do século XX.

Palavras-chave: Sintaxe espacial, análise alfa do espaço urbano, programação em lógica, Prolog

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INTRODUCTION

Space syntax is a set of techniques for analysing urban settlements and buildings, as well of theories linking space and society founded on Architecture, Engineering, Mathematics, Sociology, Anthropology, Ethnography, Linguistic, Psychology, Biology and Computer Science. It was developed originally by Bill Hillier, Julienne Hanson and colleagues at the Bartlett School of Architecture and Planning, University College of London (UCL), since the 1970s. Their innovative approach was condensed in three landmark books: *The Social Logic of Space* (Hillier and Hanson, 1984), *Decoding Homes and Houses* (Hanson, 1998) and *Space is the machine: a configurational theory of architecture* (Hillier, 2007).

An important contribution of space syntax is the study of urban form using *discrete systems*, that is, computer-aided recursive techniques based on *elementary generators* such as a pair of open and closed cells. Another key contribution is the concept of *depth* in urban systems and its relationship with social phenomena like pedestrian movements or crime incidence, with special focus on different uses of open spaces by inhabitants and strangers, men and women, old and young, adults and children, and so on (Hillier, 2007: 146-152). Anyway, space syntax has influenced and contributed to several projects, namely, the redesign of Trafalgar Square or the location of the Millennium Bridge, both in London. Thus, space syntax is a relevant and universal scientific approach for spatial studies, namely those concerned with the understanding of and intervention in public open spaces.

Space syntax is mainly concerned with the study of the relations between *convex spaces*. Convexity exists when straight lines can be drawn from any point in a space to any other point in it without going outside of the space itself (Hillier and Hanson, 1984: 97-98). In fact, convex spaces rather that concave stimulate social interaction in the sense that everyone sees everybody within that kind of space. Thus, the starting point of a syntactic analysis is typically a map of the fattest convex and open (or permeable) spaces that cover the settlement (or building) in question. Eventually, this framework can be represented by an axial map with the smallest set of straight lines that pass through all convex spaces or by a map of segments. Then, several syntactic measures can be computed to explore the connectivity between spaces and lines or the angular deviation between segments in order to evaluate the degree of asymmetry (or integration) and distributeness of each convex space/line/segment or of the whole system (Heitor and Pinelo Silva, 2015: 154-164).

Space syntax analyses are typically performed with Depthmap (Turner, 2004) and similar software (Heitor and Pinelo Silva, 2015: 167-169). In these packages, the input is the convex/axial/segment map with the spatial configuration of the complex in question, previously designed with Computer-Aided Design (CAD) or Geographic Information System (GIS) software. This preparatory task may be laborious and difficult, namely for researchers from social and economic sciences, which as a rule

limits the dissemination of space syntax techniques beyond architects and urban planners. Here, we propose a new approach to perform syntactic analyses that do not require a previously designed map, but only the declaration in a Prolog program of the connections between axial lines or convex spaces of a settlement or building, given a simple map/plant of it.

Besides the practical goal stated, this innovative approach aims to capture the essence of space syntax. Prolog is a *Logic Programming* language developed by Alain Colmerauer, Philippe Roussel, Robert Kowalski and colleagues between Montreal, Marseilles and Edinburgh in the 1970s (Colmerauer and Roussel, 1993). It uses logic to represent knowledge and uses deduction to solve problems by deriving logical consequences (Kowalski, 1988: 38). A corollary of using logic to represent knowledge is that such knowledge can be understood declaratively. This kind of reasoning is embodied in space syntax when it represents spatial arrangements as a *field of knowables*, that is, as a system governed by a simple and abstract underlying system of concepts (Hillier and Hanson, 1984: 66). In fact, clump, concentric, estate and other syntactic processes defined in the book *The Social Logic of Space* are recursions of simple relations between open and closed primary cells (Hillier and Hanson, 1984: 78). Prolog is recursive by construction and uses relational clausal logic in a straightforward way to declare binary concepts like *containment* or *adjacency* used to define the elementary generators of space syntax processes. Thus, the social (and economic) logic of space can, and ought to be, represented by a logic and declarative programming language such as Prolog.

Here, the application of Prolog to space syntax is illustrated by the case of the Areeiro urban settlement in Lisbon, Portugal. This remarkable borough was planned in 1938 by João Guilherme Faria da Costa [1906-1971] for 9,000 inhabitants with 2,680 dwellings and it was constructed in two phases starting in 1940 and 1948 (Lamas, 1992: 284). It had resulted from mayor Duarte Pacheco's aim to expand Lisbon to the north-east on expropriated land with a strong public control. Both Areeiro and Alvalade, also planned by Faria da Costa (in 1945), are good examples of settlements that combine traditional urban forms with modern concerns, namely, a hierarchy of streets or the implementation of public facilities (schools, pools, churches, gardens) in neighbourhood units.

This chapter is organised as follows: in the theorical framework, we briefly describe the key concepts of space syntax with a focus on configuration, depth and elementary generators. In the methodological section, we show how syntactic measures can be computed with Prolog in an elegant and straightforward way, drawing on the Areeiro neighbourhood as case study. Then, we present the main results of the syntactic analysis of this neighbourhood. Finally, some conclusions and future developments are pointed out.

FRAMEWORK

Based on graph theory and computer-aided simulations, *space syntax* aims to find and explain the relation between spatial configurations and social activities. *Configuration* is a concept addressed to the whole of a complex (settlement or building) rather than to its parts that captures how the relations between two spaces, say A and B, might be affected by a third space C (Hillier, 2007: 23-24). For instance, if A and B are adjacent or permeable, then they have a symmetric configuration in the sense that if A is neighbour of B, then B is neighbour of A, as illustrated by the left-hand side of Figure 1.

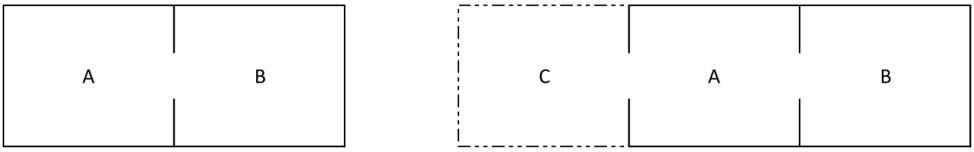

Fig. 1: Basic configurations. Adapted from Hillier (2007: 24)

However, if only A is connected with a third space C, as in the right-hand side of the same figure, A and B become asymmetrical in relation with C, because we have to go through A to get to B from C, but we do not have to go through B to get to A from C. Thus, *asymmetry* relates to *depth*, that is, to the number of spaces (or steps) to go from some space, say C, to another space, A (1 step), B (2 steps), and so on.

$$C \rightarrow A \rightarrow B \rightarrow \ldots$$

If we count the number of steps to go from some space to every other space in a complex, we can get a measure of its *total depth* (TD), or of its *mean depth* (MD), by dividing that total by the number of spaces in the complex minus one (Hillier and Hanson, 1984: 108) (Hanson, 1998: 27-28). In the previous example, the total depth of C is 3 which is the sum of steps to reach A and B (1+2) from that origin. This is also the case of B, but the total depth of A is 2, noting that this (central) space is directly connected with both B and C spaces (1+1). Thus, the mean depth is 1 (2/2) for A, and 1.5 (3/2) for B and C, noting that the number of spaces minus one in this simple complex is 2 (3-1).

This simple illustration suggests that syntactic measures can be computed for every (convex) space in a settlement or building. Then, we may find that some spaces have lower depth than all other spaces (A in the same example), and others have greater depth (B and C). The former are the most integrated spaces, where social life and/or economic activities such as retail trade might be concentrated in cities (Heitor and Pinelo Silva, 2015: 162), or the living room in most houses (Hillier and Hanson, 1984: 155-158) (Hanson, 1998: 104-105) (Hillier, 2007: 25-27). The latter are typically

the most segregated, quite removed or remote spaces in a town, building or house. Thus, *integration* is inversely related with *depth*. It is a *global* measure in the sense that it considers the configuration of one space in relation with all other spaces (or with spaces at some radius of *n* steps from the original space). Besides, *local* measures such *control* are based on the relations between each space and only the spaces directly connected to it (Turner, 2004: 14).

As an intelligent critique of Modernism, space syntax stresses the deep tree-like configuration of modern estates (Hillier and Hanson, 1984: 129-132, 262-263). A *tree* is a special kind of graph which contain a *root* such that there is a unique path from the root to any other node (Flach, 1994: 83). Thus, trees are necessarily non-cyclic or *acyclic*, that is, they do not contain paths from a node to itself. The absence of 'rings' in trees give them a *non-distributed* rather than a *distributed* configuration, where there is more than one independent route from one space to another, including one passing through a third space (Hillier and Hanson, 1984: 148). *Distributedness* can be illustrated by a recursive discrete process where a primary cell or syntactic type is 'glued' to cells of the same type by the space 'between' them, meaning that the global structure of the settlement is distributed amongst all primary cells (Hillier and Hanson, 1984: 11).

The analysis of urban settlements as discrete systems is founded on the premise that urban forms, in general, can be structured or generated from some elementary types. Hillier and Hanson (1984: 55-62) showed how the 'beady ring' structure observed in some French rural villages can be generated with the aid of a computer by applying recursively and randomly a very simple syntax, called 'clump' and denoted by Xy because it is composed by a closed cell or elementary building X adjacent (or permeable) to an open cell y. Other elementary generators (Hillier and Hanson, 1984: 78) are the concentric type, where X is put inside another closed cell or boundary, here denoted by (b o X) where 'o' represents the relation of containing, and the block or estate syntax where several adjacent buildings are enclosed inside a boundary, namely, (b o XXXXX).

The clump syntax, visible in many traditional villages and towns, is associated with symmetric and distributed urban forms, while the concentric and estate types are the staple of modern, typically asymmetric and non-distributed settlements. For instance, the Portela estate, located in Sacavém – Loures, near Lisbon, can be generated on a computer using Prolog from the elementary forms described in Figure 2 (Fernandes, 2021).

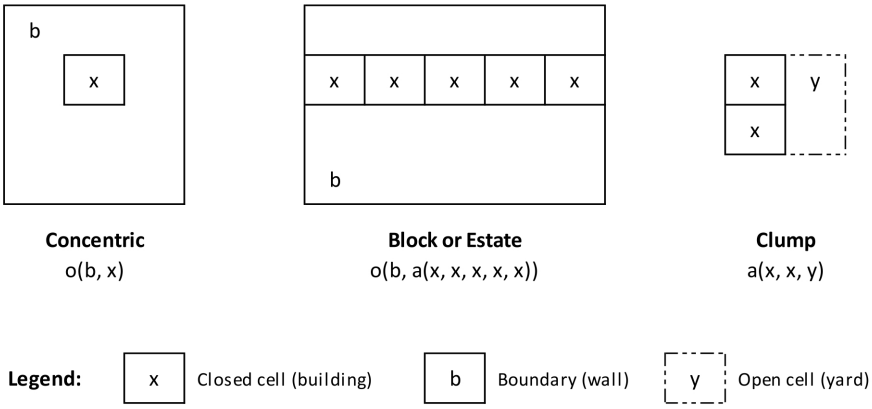

Fig. 2: Elementary generators

METHOD

A Prolog *program* is a knowledge base (or database) composed by a collection of facts and rules which describe a set of relations of interest (Blackburn et al., 2006). *Facts* express unconditional truths (Flach, 1994: 5), namely the connections between lines in an axial map (the longest and fewest lines that cover the street grid) or between spaces in a convex map (Hillier and Hanson, 1984: 91-92) (Hillier, 2007: 98).

In Areeiro's axial map (Figure 3), from left to right and from north to south, we know that Rua Oliveira Martins is directly connected with four lines: Avenida São João de Deus (the northern limit of the settlement), Avenida Sacadura Cabral (through a pedestrian passage/tunnel), Rua Edison and Avenida João XXI. These facts can be declared in a Prolog program (text file), e.g. `areeiro.pl`, in the following fashion:[1]

```
connected(rua_oliveira_martins,av_sao_joao_de_deus,1).
connected(rua_oliveira_martins,av_sacadura_cabral,1).
connected(rua_oliveira_martins,rua_edison,1).
connected(rua_oliveira_martins,av_joao_xxi,1).
```

These four clauses or *atoms* belong to the same *predicate* because they have the same *name* ('connected') and the same *arity*, that is, the same number of arguments (three) enclosed in parentheses and separated by commas (Flach, 1994: 25, 31). Here, the third argument is the topological distance between two adjacent lines, that is, one. In some applications, it might be greater than one in order to incorporate the metric distance or other cost (e.g. stairs or ramp) between two convex spaces, but here we adopt the topological distance introduced in *The Social Logic of Space* (Hillier and Hanson, 1984: 103). Clauses of the same predicate

[1] The complete areeiro.pl program is publicly available on the SWISH webpage: https://swish.swi-prolog.org/p/areeiro.pl

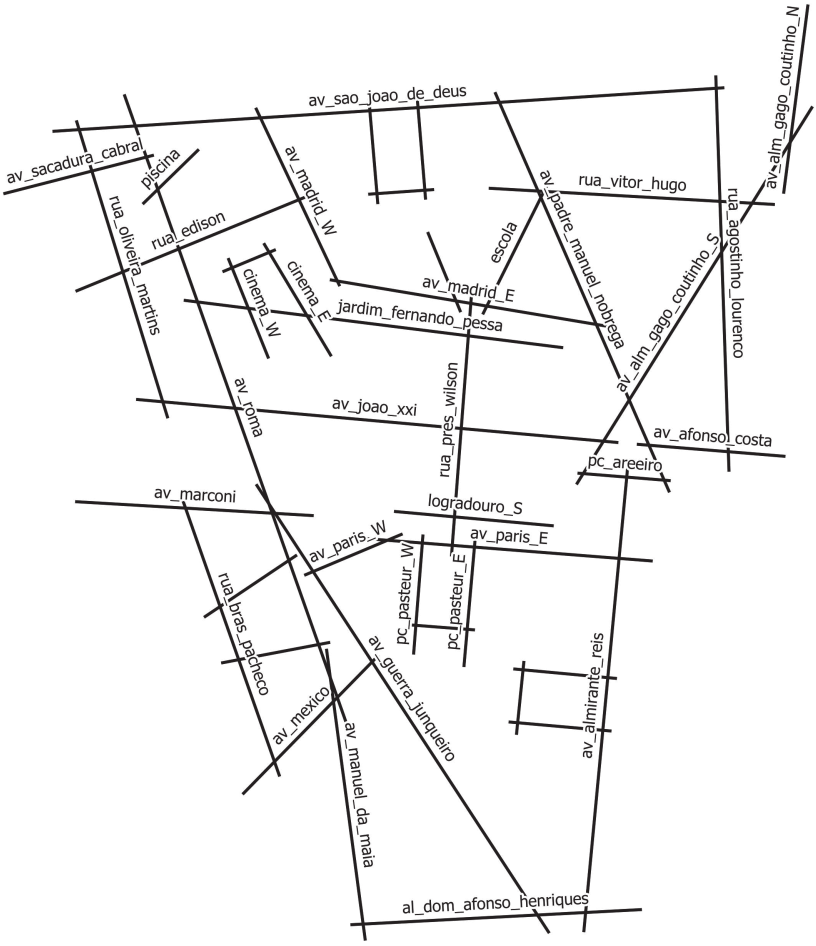

Fig. 3: Axial map of Areeiro

must be declared jointly in a Prolog program, so we must add the remaining connections pertaining to the Areeiro's axial map to our knowledge base in order to proceed, namely:[2]

```
connected(av_sao_joao_de_deus,av_roma,1).
connected(av_sao_joao_de_deus,av_madrid_W,1).
connected(av_sao_joao_de_deus,pc_afranio_peixoto_W,1).
...
connected(pc_joao_do_rio_S,pc_joao_do_rio_W,1).
```

Then, after consulting the program `areeiro.pl` with a distribution such SWI-Prolog (Wielemaker et al., 2012) readily available online on the SWISH platform

[2] The complete list of connections is available at the path (URL) indicated in the previous footnote.

(https://swish.swi-prolog.org/p/areeiro.pl), we may ask it about the *Y* lines connected, for instance, with Rua Oliveira Martins by posing the query:

```
?-connected(rua_oliveira_martins,Y,1).
```

where the prefix '?-' indicates that this is a query rather than a fact. In Prolog, a *variable* such *Y* is written as a sequence of letters and digits, beginning with a capital letter or underscore. An answer to the previous query, e.g. Avenida São João de Deus, will be written `{Y -> av_sao_joao_de_deus}` following the notation of Flach (1994: 5). This means that Prolog found a value for the variable *Y*, that is, a *solution* given the knowledge base previously loaded and consulted. If asked, Prolog will try to find more values to *Y* given the knowledge base, namely, `{Y -> av_sacadura_cabral}`, `{Y -> rua_edison}` and `{Y -> av_joao_xxi}`. These are the axial lines 1-step away from Rua Oliveira Martins, that is, at depth 1 from this root.

For practical purposes, we must create a pair of *rules*, that is, of conditional truths that can only be drawn when their premises are known to be true (Flach, 1994: 5), which isolates the lines that are adjacent with some axis *X* in the sense that it can be connected with *Y* or, conversely, *Y* can be connected with *X*:

```
adjacent(X,Y,1):-connected(X,Y,1).
adjacent(X,Y,1):-connected(Y,X,1).
```


where the symbol '`:-`' should be read as 'if'. These rules mean: 'for any values of *X* and *Y*, *X* and *Y* are adjacent if *X* is directly connected with *Y* or *Y* is directly connected with *X* with a topological distance of 1'. Now, we can compute the *axial connectivity* (AC) of a line, say Rua Oliveira Martins, which is the number of other lines it intersects (Hillier and Hanson, 1984: 103) using the SWI-Prolog built-in predicate `aggregate_all/3` with the template count:

```
connectivity(X,Y,AC):-
aggregate_all(count,adjacent(X,Y,1),AC).
```

For instance, the following query returns `{AC -> 4}` because Rua Oliveira Martins is directly connected with four axial lines, as said:

```
?-connectivity(rua_oliveira_martins,Y,AC).
```

Connectivity is the basic syntactic measure in the sense that the others are based on it (Heitor and Pinelo Silva, 2015: 158). In particular, the measure of *control* (E) proposed by Hillier and Hanson (1984: 109) and implemented below, sums up the space given *G* to some space *X* by its immediate (adjacent) neighbours *Z*, where *G* is the reciprocal of the axial connectivity (AC) of each *Z,* and the comma '`,`' between predicates should be read as 'and':

```
control(X,Y,E):-aggregate_all(sum(G),(adjacent(X,Z,1),
connectivity(Z,Y,AC), G is 1/AC),E).
```

This specific rule illustrates how useful and pedagogical Prolog can be in describing the syntactic concepts. In fact, it suggests the direct relation of control with the original line's connectivity, that is, with the number of its adjacent neighbours, as well as the inverse relation with the connectivity of the last ones. In fact, spaces with a strong control, that is, with an E greater than 1, are typically connected with several spaces, namely, 'cul-de-sacs' or streets with few connections. So, in order to be controlling, a line must see many spaces, but these spaces should each see relatively little (Turner, 2004: 16). In the Areeiro settlement, the case of Avenida de Roma is remarkable with `{E -> 4.593}`, which can be computed by formulating the query:

```
?-control(av_roma,Y,E).
```

Control is a *local* measure, since it only considers relations between a space (line) and its immediate neighbours (Hillier and Hanson, 1984: 109). Another local measure, *controllability*, picks out areas that may be easily visually dominated (Turner, 2004: 16). It is simply the ratio of connectivity to the total number of spaces 1- or 2-steps away from the original space. In order to compute this measure as well as relative asymmetry we must define a predicate for *depth*. Obviously, axial connectivity is related with the concept of depth 1 in the sense that it is the number of lines 1-step away from the original line. In fact, we can define a rule such that *Y* is 1-deep from *X* if *X* and *Y* are adjacent:


```
depth(X,Y,1):-adjacent(X,Y,1).
```

Similarly, the lines 2-steps away from the original line are 1-step away from the lines adjacent to the root. The following rule explores this recursive nature of depth, that is, the spaces at depth 2 from *X* are the spaces *Y* at depth 1 from the spaces *Z* adjacent of *X*:

```
depth(X,Y,2):-adjacent(X,Z,1), depth(Z,Y,1), dif(X,Y).
```

where the SWI-Prolog built-in predicate `dif/2` introduces a constraint such that every 2-deep line *Y* must be different from the original line *X* in order to avoid backward relations. The following illustrative query returns a list, indicated by square brackets '`[Y]`', with the lines 2-steps away from Rua Oliveira Martins:

```
?-distinct([Y],(depth(rua_oliveira_martins,Y,2))).
```

where the built-in predicate `distinct/2` eliminates duplicates, that is, 2-deep lines such as Avenida de Roma that can be accessed through two or more lines directly connected with the original space, in this example Rua Oliveira Martins. Depth 3 can be defined in the same recursive way by isolating the spaces 2-steps away from the spaces *Z* directly connected with the original space *X*, depth 4 by isolating the deep 3 spaces, and so on:

```
depth(X,Y,3):-adjacent(X,Z,1),depth(Z,Y,2),dif(X,Y).
depth(X,Y,4):-adjacent(X,Z,1),depth(Z,Y,3),dif(X,Y).
depth(X,Y,5):-adjacent(X,Z,1),depth(Z,Y,4),dif(X,Y).
depth(X,Y,6):-adjacent(X,Z,1),depth(Z,Y,5),dif(X,Y).
depth(X,Y,7):-adjacent(X,Z,1),depth(Z,Y,6),dif(X,Y).
depth(X,Y,8):-adjacent(X,Z,1),depth(Z,Y,7),dif(X,Y).
depth(X,Y,9):-adjacent(X,Z,1),depth(Z,Y,8),dif(X,Y).
```

It is important to note that a space or line may be accessible at several steps from the same origin. For instance, Rua Edison is either 1-step away from Rua Oliveira Martins or 3-steps away because we can go through Avenida João XXI and Avenida de Roma to get there. This occurs in every axial map with 'rings' or 'islands', such Areeiro. So, we must create a new rule to set the minimum number of steps D to go from X to Y once again using the Prolog's predicate `distinct/2`:

```
graph(X,Y,D):-distinct([Y],depth(X,Y,D)).
```

We named this predicate '`graph`' because it analytically generates the *justified graph*, or j-graph, for a root *X*. The resulting j-graph is a 'picture' with the depth of all spaces in a complex from a point in it (Hillier, 2007: 22-23, 72-73). For instance, we can analytically describe the j-graph of Rua Oliveira Martins with the following simple query:


```
?-graph(rua_oliveira_martins,Y,D).
```

to get:

```
{Y -> av_sao_joao_de_deus, D -> 1}
{Y -> av_sacadura_cabral, D -> 1}
{Y -> rua_edison, D -> 1}
{Y -> av_joao_xxi, D -> 1}
{Y -> av_roma, D -> 2}
{Y -> av_madrid_W, D -> 2}
...
{Y -> pc_joao_do_rio_W, D -> 6}
```

The predicates `graph/3` and `connectivity/3` are the 'building blocks' to compute several measures, namely, the above-mentioned *controllability* (F):

```
controllability(X,Y,Z,F):-connectivity(X,Y,AC), aggregate
_all(count, graph(X,Z,2), D2), F is AC/(AC+D2).
```

Another measure that can be computed with `graph/3` is *mean depth* (MD) referred to in the previous section. It is calculated by summing up the depth values D from a root *X* and dividing by the number of spaces (lines) in the complex minus one, as explained above (Hillier and Hanson, 1984: 108). The following implementation introduces two preliminary or auxiliary predicates that compute the *total depth*

(TD) and the number of *nodes* (N) in the complex except the root:

```
totdepth(X,Y,TD):-aggregate_all(sum(D),graph(X,Y,D),TD).
nodes(X,Y,D,N):-aggregate_all(count,graph(X,Y,D),N).
meandepth(X,Y,D,MD):-totdepth(X,Y,TD), nodes(X,Y,D,N), MD
is TD/N.
```

Mean depth is an important syntactic measure and its reciprocal can be used as a simple measure of the *integration* of each space in a complex, as suggested by Heitor and Pinelo Silva (2015: 162):

```
integration(X,Y,D,I):-meandepth(X,Y,D,MD), I is 1/MD.
```

Nevertheless, the value of total or even mean depth can be affected by the number of nodes in a graph. Thus, Hillier and Hanson (1984: 108) proposed a normalisation of MD which eliminates the bias due to the number of nodes, that is:

```
asymmetry(X,Y,D,RA):-totdepth(X,Y,TD), nodes(X,Y,D,N), RA
is 2*(TD/N-1)/(N-1).
```

This will give a value between 0 and 1, with low values indicating a space which tends to integrate the whole complex or system, and high values a space which tends to be segregated from the system. Thus, *relative asymmetry* (RA), also denoted by 'i-value' (Hillier, 2007: 77), is a normalised measure of integration.[3]

The RA measure can be used to compare different systems with (approximately) the same number of spaces. However, if the systems differ considerably in size, a second normalisation must be applied because a small system always looks more integrated than a large one (Turner, 2004: 14). To deal with this empirical problem, Hillier and Hanson (1984: 109-113) proposed a second standardised measure, the *real relative asymmetry* (RRA), which is the RA value of the space divided by the RA value of the root of a graph shaped like a 'diamond' where there are *k* nodes at middle level, *k*/2 at one level above and below the middle level, *k*/4 at one level above and below the *k*/2 level, and so on, until there is one node at the root and deepest nodes (Teklenburg et al., 1993: 350-351). The following implementation uses the formula proposed by Krüger and Vieira (2012: 200) to estimate the RA value of the root of that diamond (*d-value*):

```
dvalue(K,DV):-DV is 2*(K*(log((K+2)/3)/log(2)-1)+1)/
((K-1)*(K-2)).
rra(X,Y,D,RRA):-asymmetry(X,Y,D,RA), nodes(X,Y,D,N),
dvalue(N+1,DV), RRA is RA/DV.
integrationHH(X,Y,D,IHH):-rra(X,Y,D,RRA), IHH is 1/RRA.
```

Both RA and RRA are measures of *asymmetry*. Besides, *distributedness* can be

[3] The mentioned program areeiro.pl, available on the SWISH webpage, has additional predicates to compute radius-r integration and other local measures.

evaluated using either control (or controllability) or *relative ringiness* (RR). The RR of some space is the number of independent rings that pass through that space over the maximum that can pass through it, which will be the total number of nodes in the system minus one (Hillier and Hanson, 1984: 153-154). Detecting the number of rings that pass through one particular space is a very difficult task to be performed by a computer: for instance, the software Depthmap (Turner, 2004) does not compute RR. As a programming language concerned with Artificial Intelligence, Prolog can do the task relatively well in most cases. In fact, the following code will produce accurate estimates for RR, namely where the number of independent rings is smaller than axial connectivity:

```
graph2(X,Y,D):-distinct([Y],(depth(X,Y,D),D>1)).
ring(X,Y,Z,D):-adjacent(X,Y,1), graph2(Y,X,D), connectivity
(X,Z,AC), AC > 1.
rings(X,Y,Z,D,R):-
aggregate_all(count,(ring(X,Y,Z,D)),C), R is max(C-1,0).
ringiness(X,Y,Z,RR):-rings(X,Y,Z,D,R),nodes(X,Y,D,N), RR
is R/N.
```

RESULTS

The key syntactic measures computed with Prolog for the *integration core*, that is, for the 25% most integrating spaces of Areeiro are presented in Table 1[4]. Typically, greater connectivity is associated with the most integrated (or less segregated) spaces, namely, Avenida de Roma (directly connected with 12 lines), Avenida São João de Deus or Avenida Padre Manuel da Nóbrega (both connected with 7 lines), but

Axial lines	AC	E	F	TD	MD	I	IHH	RA	RRA	RR
av_roma	12	4.593	0.414	101	2.349	0.426	2.247	0.064	0.445	0.233
av_joao_xxi	4	0.700	0.174	109	2.535	0.394	1.974	0.073	0.507	0.070
av_sao_joao_de_deus	7	2.060	0.280	111	2.581	0.387	1.916	0.075	0.522	0.140
rua_pres_wilson	5	1.900	0.278	112	2.605	0.384	1.888	0.076	0.530	0.070
av_padre_manuel_nobrega	7	1.926	0.304	115	2.674	0.374	1.810	0.080	0.553	0.140
jardim_fernando_pessa	4	1.283	0.211	116	2.698	0.371	1.785	0.081	0.560	0.070
av_guerra_junqueiro	5	1.500	0.250	119	2.767	0.361	1.715	0.084	0.583	0.093
av_alm_gago_coutinho_S	6	2.226	0.333	121	2.814	0.355	1.671	0.086	0.599	0.093
av_manuel_da_maia	3	0.667	0.177	126	2.930	0.341	1.570	0.092	0.637	0.047
av_madrid_E	5	2.010	0.294	127	2.953	0.339	1.551	0.093	0.645	0.070
av_almirante_reis	5	1.867	0.357	127	2.953	0.339	1.551	0.093	0.645	0.093

AC - Axial Connectivity; E - Control; F - Controllability; TD - Total Depth; MD - Mean Depth; I - Integration Heitor & Pinelo Silva (1/TD); IHH - Integration Hillier & Hanson (1/RRA); RA - Relative Asymmetry; RRA - Real Relative Asymmetry (RA/d-value); RR - Relative Ringiness

Table 1: Syntactic measures for Areeiro's integration core computed with Prolog

[4] The same values are obtained using DepthmapX 0.8.0, except for controllability, with Prolog producing slightly different estimates. Relative ringiness (RR) is not calculated by Depthmap.

exceptions can occur, such Rua Presidente Wilson/Rua Cervantes (connected with only 5 lines), Jardim Fernando Pessa (4 lines) or Avenida Manuel da Maia (3 lines).

Where connectivity and integration happen together, complexes are said to be *intelligible* (Hillier, 2007: 94-95). This kind of relation is not readily evident in Areeiro, where the integration core includes secondary and/or less connected lines, as stated above. This is a direct consequence of the openness of city blocks derived from installing public gardens such Jardim Fernando Pessa, schools, pools and other facilities in the backyard of the main streets, which gave them an unexpected centrality. In fact, Areeiro was the first borough in Lisbon with neighbourhood units and open (U-shaped) blocks of flats (Salgado and Lourenço, 2006: 62). This modern attitude originated asymmetries, namely, segregated 'main' streets and a strange paradox: Praça do Areeiro, the 'regulator square' of the settlement projected by architect Luís Cristino da Silva [1896-1976] between 1938 and 1949 (Becker et al., 1997: 188-189), is a moderately integrated space with an i-value (RA) of 0.097 and a reciprocal of mean depth (I) of 0.328. Thus, it is not included even in the core of the 25% most integrated spaces.

Nevertheless, Areeiro is an intelligible settlement in the sense that the linear correlation between connectivity and integration is high (0.794). This close relation between what can be seen from each space and what cannot be seen (Hillier, 2007: 94) is suggested by the agglomeration of points around the line in Figure 4. The outlier located at the north-east end of the figure corresponds to Avenida de Roma. Its prominence is extended also to relative ringiness (RR) with a high value (0.233, see Table 1). This result suggests that one in every four possible rings in Areeiro go through that avenue. Thus, Avenida de Roma is not only the most connected and integrated space but also the distributive axis of Areeiro (and Alvalade). This latter role of Avenida de Roma is also suggested by the high values of control (E, 4.593) and controllability (F, 0.414).

Besides, the Areeiro settlement validates well-known facts about space syntax, namely the effect of grid deformation on integration found by Hillier and Hanson (1984: 124-125) for the Barnsbury area in London. In fact, the 'deformed' axis of Avenida Guerra Junqueiro / Praça de Londres is one of the most integrated spaces in the Areeiro borough (see Table 1), concentrating retail trade, coffee shops and other economic and social activities (e.g. church). This centrality resulted also from a good relationship with the larger-scale system where this axis is embedded, namely, with the pre-existing southern boundary of the settlement (Alameda Dom Afonso Henriques) and with Alvalade, the northern settlement developed after Areeiro, which is also structured by the most integrated and distributed space of the Areeiro neighbourhood, that is, Avenida de Roma.

A good integration resulting from grid deformation is also found in Avenida Padre Manuel da Nóbrega, another shopping street near Areeiro square. In fact, retail trade

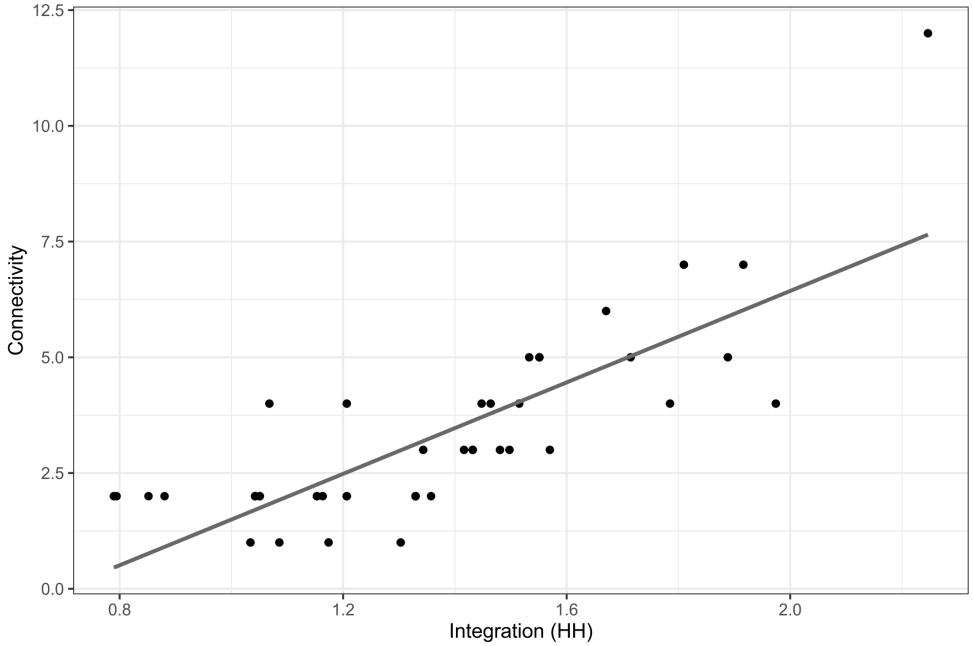

Fig. 4: Relation between connectivity and integration in Areeiro (intelligibility)

is typically located at the most integrated axes as suggested by Figure 5, with a reasonable correlation coefficient of 0.644. However, some exceptions do exist in Areeiro, for example Avenida São João de Deus and Avenida Manuel da Maia.

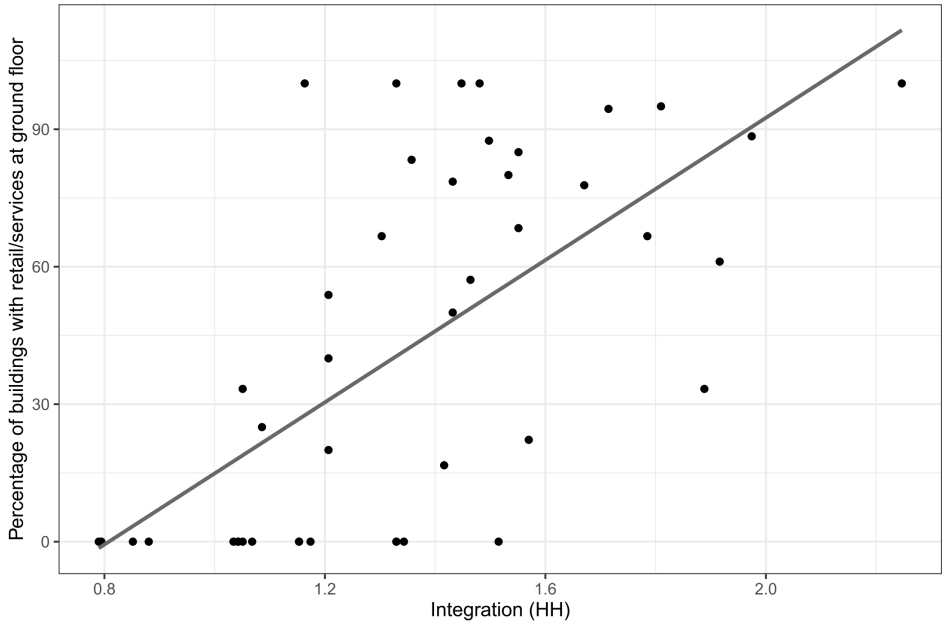

Fig. 5: Relation between incidence of retail/services at ground floor level (% of buildings) and integration in Areeiro

In fact, these integrators have moderated incidence of retail/services on the ground floor of their buildings (61.1% and 33.3%, respectively) because they were built on one side only: the other (northern) side of Avenida São João de Deus is bordered by a railway, and Avenida Manuel da Maia is bordered at full extension from the west by the backyard of a public building (that of Statistics Portugal), which limits their attractiveness as shopping streets.

CONCLUSION

The latter result suggests that space syntax does not show the whole story, because syntactic measures do not account for the facade's orientation to the sun, the sides' built-up or even the current uses of axes or convex spaces. In fact, the location (or concentration) of social and economic activities may privilege sunny facades, 'corridor' streets built on both sides, flat layouts instead of climbing streets, the presence of green spaces and other amenities, as well as urban areas with previously installed activities in order to explore economies of agglomeration and movement. This kind of factors can be critical to evaluate the quality and liveability of open spaces in addition to distributedness, integration, intelligibility and other proprieties captured by space syntax methods.

Nevertheless, the contribution of space syntax towards understanding how configuration can structure and influence social relations is undeniable. Empirical studies have suggested that integration (or relative asymmetry) is the key feature to predict human co-presence and movement in cities (Hanson, 1998: 1). Space syntax methods can also detect layout problems, namely, 'dead areas', or how (public sector) housing estates connect to their surroundings (Hillier et al., 1989: 5). Finally, space syntax theories based on discrete systems show how complex structures can be generated from simple patterns given basic rules (Hillier and Hanson, 1984: 59-61).

In fact, space syntax was founded on the premise that even complex spatial arrangements, just like natural languages, are systems governed by simple concepts and rules. Prolog was founded on the same idea. In fact, Prolog was born as a research project to process natural languages using grammars. Thus, space syntax and Prolog are similar in reasoning, and both represent knowledge in a declarative way. Indeed, the 'problem of knowability' is paramount not only to space syntax but also to Artificial Intelligence (and Prolog), as stressed by Hillier and Hanson (1984: 46) in their seminal work.

The present research suggests that Prolog can be used to good effect to describe an urban settlement such as Areeiro as a 'field of knowables' or an 'intelligent system'. It is an appropriate tool for syntactic analyses of small or medium-sized complexes following the 'case study' approach introduced by Hillier and Hanson (1984) and Hanson (1998). Definitely, Prolog is not the tool to perform deep analyses of whole cities or metropolitan areas where Depthmap (or another similar package) should be privileged.

Thus, future developments of this research will cover restricted modern and/or public housing estates as well as buildings with traditional architecture in line with the anthropological tradition of space syntax. Anyway, the inclusion of economic reasoning in space syntax theories and methods, complementing the contributions of other sciences, is another line of development that may use Logic or Dynamic Programming.

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PARTE DOIS
RELATÓRIOS DE PROJETOS

PART TWO
RESEARCH SYNTHESIS REPORTS

The digits that follow the authors' name correspond to their ORCID iDs and should be viewed at https://orcid.org/[displayed digits]

A review of urban river restoration projects. Practices and challenges

António D'Orey, Nagayamma Aragão, Carlos Smaniotto Costa, Tiago Duarte

Abstract - *Urban rivers are one of the most threatened ecosystems in the world, being the focus of neglect or costly restoration. It is therefore urgent to identify appropriate technical solutions that, associated with social innovations and collaborative planning approaches, can guide new ways of treating the water of rivers threatened by urban pressures – in particular in the context of climate change, biodiversity and economic challenges. This chapter reports on a research project that attempted to examine interventions in rivers through the lens of environment, planning, technology, and societies. The Project Base Platform Urban Rivers – baseRiU aimed to expand the body of knowledge dedicated to the research on and ways to approach urban rivers. Besides providing a broad base for further research, the findings clearly have shown that resources invested in restoration, renaturing and bringing rivers back to the city make the best investment, as cities become wealthier, with more complex (green and blue) structures, more biodiverse, and environment-, climate- and people-friendlier. Creating sustainable solutions, rediscovering urban rivers' multiple values to society and the environment can be a driving force in the transition to more sustainable (urban) systems. Yet, bending the curve towards sustainability also requires a radical change in mindsets – and to guide this we need more practice-based evidence.*

Keywords - Rivers and watercourses, restoration and regeneration, riverain communities, participatory processes, place-based networks

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INTRODUCTION

A growing body of research points to urban rivers as one of the most threatened ecosystems in the world (Francis, 2012; Ceola et al., 2015; Smaniotto et al., 2015; Grizzetti, et al., 2017), as they succumb to pollution, degradation, neglect or costly restoration. There is an urgent need for a debate on global warming, climate change, economic challenges and sustainability to identify appropriate solutions that combine technical solutions with approaches for social innovation and collaborative planning. This chapter reports on a research project that attempted to examine interventions in rivers through the lens of environment, planning, technology, and societies. The Project **Base Platform Urban Rivers – baseRiU** aimed to expand the body of knowledge dedicated to the research on and new ways to approach urban rivers. The outcomes and findings help to create a reference base for the development of further research activities on the topic in the Research Group CIDATE[1], which has been already assigned the overall coordination of the network Cyted RUN (420RT0008)[2] Citizen Science and Co-creation as a way to improve river regeneration and risk minimization (01/2021 - 12/2025) involving fifteen Ibero-American partners. Thus, by reviewing past practices, the baseRiU platform aimed to systematically organise the scientific and technical foundations of urban and environmental planning related to urban rivers. It provides insights into the relationship between rivers and design interventions for urban riverside regeneration, intertwining them with citizen science and participatory processes.

UNDERSTANDING THE SCOPE OF URBAN RIVERS

The research of baseRiU is centred on rivers and watercourses under human pressure, in particular those for urban uses. "River", as used in the research and in this report, is an all-embracing term to include all kinds of watercourses of vastly different types. Thus, a river is "*a system of surface waters constituting, by virtue of their physical relationship, a unitary whole and normally flowing into a common terminus*", as suggested by UN (1997). Rivers are a natural resource that is essential for human settlements, as they provide fresh water, as a means of transport and communication, defining the urban fabric, and as a means of subsistence, as in the case of developing countries where the population depends directly on the water of the rivers. Rivers are, as Uslu & Shakouri (2013) assert, often relics of natural habitats in urban settings, building the physical link between natural, rural areas and cities and regions – therefore they are or could be an important linear connection between the natural and the manmade environments. They are also a link within cities, and for many cities they provide the scenery for their cityscape, morphology and shape. Rivers are also the link between countries serving as (transport) corridors and borders.

[1] Research group on Citizen science in understanding and transforming the territory, https://urbanismo.ulusofona.pt/en/urbanismo-lusofona-en/research/

[2] http://cyted.org/es/run, https://run.ulusofona.pt

In spite of these positive aspects, in the course of urban development, human pressure on rivers has been increasing (Hoyer et al, 2011; Ceola et al, 2015) and unsustainable urbanisation processes have contributed to the accelerating degradation of rivers in many cities "… *often to the extent that they no longer provide the services to society from which the settlements developed*" (Everard & Moggridge, 2012:295). Changes in river structures and sensible shrinkage of ecological capital raise concerns about the whole urban structure and future of life in cities. A fast and unsustainable development is part of a vaster, more widespread and complex phenomenon: the world-wide urbanisation process and multiple pressures on the environment. These lead many places to water shortage, threaten water security, cause water pollution and environmental degradation (Ceola et al., 2015), as well as the loss of biodiversity and impoverishment of the urban landscape (Geist & Hawkins, 2016). As Pattacini (2021: 1) aptly points out, rivers have "*often been forgotten, canalised, or have even disappeared into culverts*". UN-Habitat (2015:6) rightfully stresses that "*efforts to improve land management practices and the adoption of different tenure security conceptions remain limited, despite being recognized as fundamental to the provision of adequate and the eradication of poverty*". The UN (1997) calls for urgent action towards putting in place measures of protection, preservation and management related to the uses of rivers and their waters. Just as far-reaching are the consequences of the eradication of poverty, since increasing the quality of urban rivers is a guarantee of more sustainability and resilience (Leal & Sümer, 2015). During the last few decades, the issue of urban rivers as a component of urban ecology has been discussed in several studies (Everard & Moggridge, 2012; Francis, 2012; Uslu & Shakouri, 2013; Smaniotto et al, 2015; Geist & Hawkins, 2016; Grizetti et al, 2017). Also, their contributions to urban design (Smaniotto et al, 2015; Pattacini, 2021), values for community services (Ceola et al. 2015), and the interconnected benefits that restored rivers and ecosystems can provide to society (Everard & Moggridge, 2012) are being acknowledged.

Regenerating/renaturing such natural resources increases the environmental quality and enriches biodiversity in urban areas, and both become vital to ensure and safeguard a safe environment. Thus, creating the knowledge needed to respond in a timely manner to emerging needs and opportunities, as well as providing direct support to riparian communities in defining strategies and public policies, are central issues in accelerating sustainable approaches to applied tools and practices (Hoyer et al., 2011; Everard & Moggridge, 2012; Uslu & Shakouri, 2013; Smaniotto et al, 2015). To achieve the goal of creating a research base, it is essential to establish a permanent link between theoretical and applied research.

UNDERSTANDING THE VALUE OF RIVERS IN THEIR URBAN CONTEXT

The central purpose of baseRiU was to consolidate knowledge in the sphere of urban river restoration, considering for this purpose a socio-environmental and

urbanistic perspective of development. Restoration, as Vaughn et al. (2010) assert, encompasses different measures to repair damage humans inflicted to ecosystems; in this case, to watercourses that cross urban areas suffer different kinds of disturbances and pressures.

The baseRiU research combined scientific knowledge, guidelines for policy making and development strategies, which in their synergy form the scientific backbone to provide evidence for the planning of sustainable public policies (Grizzetti et al., 2017). In the search for innovative solutions, inspiring concepts such as nature-based solutions, citizen science and co-creation processes were also considered – as they allow a better understanding of the driving forces in the management and improvement of urban space. From this perspective, the analysis of examples was guided by the creation of riverbeds and bank spaces that improve environmental effectiveness and mitigate risk, along with the provision of green areas, also for recreation and leisure. Restoration, renaturalization and the recovery of urban rivers have been gaining attention in recent years (Bartalini, 2009; Hoyer et al., 2011; Everard & Moggridge, 2012; Smaniotto et al, 2015; Wohl et al., 2015, Grizzetti et al., 2017, Pattacini, 2021). The research on urban rivers is situated at the crossroads of two inseparable issues: on the one hand, there are the challenges, such as the degree of pollution, the reduction of water quality and loss of biological diversity, and the inherent risks of flooding. On the other hand, the growing recognition of the benefits to society and the economy of a healthy environment requires greater dynamism and a more significant intervention by institutions and society.

With these observations in mind, river management is an issue that can only be addressed by considering different scales - from a regional to a local scale, from the source throughout the urbanised watershed on the way to the river mouth, involving different stakeholders in partnerships that respond to local needs and harness local knowledge and capacities, thus ensuring an approach that stimulates positive and sustainable change. To this end, key issues such as inflexible and cost-intensive systems, engineering works in sensitive systems, lack of integration of stormwater management into urban design, lack of acceptance of sustainable systems, fragmented responsibilities, strong competition around open spaces, lack of public participation and institutional capacity, among others, should not be at the centre of attention. Increasing human population and land take accentuate the loss and/or deterioration of natural habitats, biodiversity and ecosystem services (Quintero et al., 2011; Uslu & Shakouri 2013; Aragão, 2014; Smaniotto et al., 2015). In a spiral of poverty, natural habitats tend to deteriorate. It is estimated that in Africa 61.7% of the population lives in informal settlements, with a projected growth from 400 million to 1.2 billion inhabitants by 2050, directly related to the decline in the prosperity of cities and environmental sustainability (UN-Habitat, 2015). Thus, combating the reduction of environmental quality and the decline of urban rivers is one of the biggest challenges faced in safeguarding the sustainability of urban areas. These

challenges become even more serious with the need to adapt to climate change and the prediction of future problems related to its management (UN-Habitat, 2015; Smaniotto et al., 2015; Smaniotto & Hoyer, 2014).

Understanding the nature of science and its relationship to society and culture is considered one of the fundamental axes of scientific literacy (McComas, 2000; Galvão, 2001; Pateman et al. 2021). This is an assumption recognised by the EC, which thus underpins its actions to promote research related to citizen science (EC, 2019a), positioning the sustainable use of natural resources and the environment as one of the three pillars of the new framework programme (Horizon Europe), an ideal reinforced in the meantime by the European ecological pact "Green Deal" (EC, 2019b). These principles correspond to the scientific-political principles of baseRiU, and contribute to building a rationale for establishing the topic of urban rivers as a strand of research at CIDATE. The foundations for this strand are already set by activities related to water courses and urban development, such as (i) the International Seminar of Urban Regeneration ReCity (2014-15) with Ribeira dos Sassoeiros in Cascais as case study, (ii) the international seminar for the creation of the Florence Regional Park (2014), (iii) the scientific exchanges with the School of Spatial Planning (Dublin Institute of Technology), Department of Forest Sciences (University of Helsinki), and Barcelona Institute of Regional and Metropolitan Studies (Universidad Autónoma UAB), which resulted in the case study analysis of water as a determinant of the urban environment, published by Springer (Smaniotto Costa et al., 2015), and (iv) a study on using mobile data in the Republic of São Tomé and Príncipe to create knowledge in a country without planning (Aragão, 2019; Aragão & Smaniotto Costa, 2022). It should also be noted that such initial assumptions are complemented by the knowledge and experience acquired in the use of collaborative and co-creative methodologies of involvement of actors in Living labs and in placemaking, of which the European projects C3Places, CyberParks and Dynamics of Placemaking[3] are representatives. Still, much remains to be explored, theorised and transformed into strategic lines of support for decision and planning.

The problems and challenges described above are emerging more in developing countries, faced with population growth and territorial transformations, and where the lack of resources and technologies associated with the low level of awareness of decision-makers further exacerbate problems in the environment - city - social fabric axis. In Africa, for example, researchers face issues of relevance or applicability of their work, lack of funding and lack of a favourable environment, since research still has low political priority, amplified by the absence of internal funding for research as a structural element of innovation to support the continent's development (Mashininga, 2017). Despite its natural resources, the continent fails to adequately harness its endowments for its own sustainable development. The clash between

[3] www.c3places.eu; www.cyberparks-project.eu; www.placemakingdynamics.eu

two constraints, the (dis)appropriation of African resources by developed countries, associated with the failure of Sub-Saharan Africa to harness its natural resources, is attributable to the absence of critical mass, human capital with adequate knowledge and skills, technology, infrastructure for innovation and entrepreneurship, and incentives to innovate.

The relationship between urban fabric - river - riverine population underscores the need for a spatial analysis of "urban" development, both within the city and beyond its formal boundaries. For more sustainable solutions, it is necessary to "take advantage of the motivation of people and communities" (Smaniotto & Hoyer, 2014: 68). Solutions should not be imposed by forcing people to change their behaviour, but by creating participatory processes, which are key to achieving behavioural change (Oliveira & Brito, 2013). Indeed, collaborative approaches are gaining attention as proactive solutions to avoid conflict and pave the way to more sustainable and just environments. Collaborative approaches are also able to generate trust among stakeholders, which is fundamental for social responsibilities. Also, volunteering is a relevant issue in promoting environmental stewardship, it contributes to the communities which the volunteers are part of as well as to enlarge and enrich data collection and the results of the measures they are involved with (Cunha et al, 2017). In the rationale of CIDATE, a strong overarching association between living labs and citizen science is considered central, as both are open ecosystems for social engagement. Newman et al. (2017) and Pateman et al. (2021) acknowledge the positive impact of using place-based networks and local knowledge to improve effectiveness, collaboration, and efficiency. This stimulates citizen collaboration and motivates partnerships in innovative ways, facilitating and accelerating behavioural changes (Oliveira & Brito, 2013). Living labs as a research concept, according to Bylund et al. (2020), offer a user-centred and open innovation framework; they put stakeholder involvement into practice, generate new scientific information and research insights. That leads to the next term – community involvement. In this study, the terms community involvement and public participation are used often and with the same meaning. Both concern the involvement of community individuals that have no commercial or political interests in the river restoration process. In other words, the community, in these cases, represents a group of individuals that live and use the city and river surroundings for their everyday life.

METHODOLOGY

In order to access different concepts and practices regarding river restoration, a case study methodology was used as a primary method and methodology (Gerring & Cojocaru, 2016). As the Internet has become a gateway to a maze of vast literature, the research consisted of a world-wide electronic search for cases, mainly on the web and in published articles and proceedings. The web-based search has the advantage

of speed and the timeliness of data/information. In the search, such keywords as *river restoration, regeneration* and *renaturing*, along with *urban riverside, riverbed regeneration, nature-based solutions* and *community involvement* were used to select promising projects.

The methodological approach, based on comparative urbanism (Nijman, 2007), focuses on a systematic identification of key processes, their different articulation and their inter-contextual interpretation. To review past practices, a template was developed and used to describe the cases. The template includes the following fields: project description and goals, actions to achieve these goals and remarks. Special heed has been given to the topic *remarks*, which is populated with filtered examples of good practice – although in many cases the information available may not be as detailed as needed. This procedure facilitates comparison and the analyses of results, to enable the identification of transferable principles and ideas in the relation of rivers to design interventions and community involvement (Creswell, 2013, 2014).

One main criterion for seeking projects is the diversity of situations, in regard to budget, promoters/drivers, goals and a wide geographic focus, with an active search for projects in Latin America and Africa. This resulted in the selection of a diverse group of 15 cases – listed in Table 1. These cases were then analysed and compared in terms of their goals, the coordination/management of the restoration, the terminology used, and, as aspects, which were relevant for baseRiU, how public participation and nature-based solutions were operationalised, and the results obtained. After this comparative analysis, the conclusions were used to build a framework of good practices regarding the aspects of community and nature-based solutions in river restoration.

Due to the need to gather current data, websites were by far the most often consulted online resource for collecting information about projects worldwide. The list of consulted websites is provided in REFERENCES and, when it was possible to detect an official website for each project, these links are provided in the description of the individual cases.

OVERVIEW OF SELECTED CASES

In this section, the search findings on 15 different cases are presented and discussed (Table 1). It intends to provide an overview of the *projects* in a structured way. Based on this mapping, the next section discusses the abilities of such projects to catalyse and push for changes – in the physical urban environment, in policies, in planning and social practices, in the communities and not least, changes in behaviour patterns related to approaches to urban rivers. Given that each project uses its own terminology, this exercise resulted in a large body of river-related terms; since standardisation or in-depth-discussion on the terms is not a goal, the descriptions keep the diversity of used terms, and use **restoration** (Vaughn et al., 2010) as an umbrella term that encompasses all activities related to improving urban rivers.

	Project title	River	City/Country
1	Charles River	Charles River	Boston, USA
2	Blue Loop	River Don and Tinsley Canal	Sheffield, UK
3	Brazilian Streams	Several cities	Brazil
4	A walking workshop along the River Auji	River Auji	Auji, Kenya
5	Raising Awareness on Rivers and Environment	Malawian rivers	Lilongwe, Malawi
6	Mystic River	Mystic River	Boston, USA
7	River Irk	River Irk	Manchester, UK
8	River Torca	River Torca	Bogotá, Colombia
9	Manuelzão Project	Rio das Velhas	Belo Horizonte, Brazil
10	River Manzanares	Rio Manzanares	Madrid, Spain
11	River Sokolówka	River Sokolówka	Lodz, Poland
12	Rios Project	Several rivers	Portugal
13	Os Nossos Rios	Rivers of the council of Vila Nova de Famalicão	V.N. Famalicão, Portugal
14	H2Óctogono Azul	River Paiva	Viseu, Portugal
15	Cascais Streams	Streams in the Council of Cascais	Cascais, Portugal

Table 1: List of selected cases

1. Charles River

Project Name	Charles River Watershed Association
River name	Charles River
City, Country	Boston, USA
Website	https://www.crwa.org/

The Charles River, located on the east coast of the USA, drains water from an area of 797 km2 comprehending 23 communities, including the city of Boston, with a population of 700 000 people. This slow moving, meandering river has had, historically, a reputation for pollution and mistreatment. In 1965, concerned about the declining condition of the river, the Charles River Watershed Association (CRWA) was founded by a group of citizens to spearhead advocacy and river protection efforts in the watershed. This association has continuously been working on behalf of the river since then, it has come a long way to professionalise their activity and is now a key figure on the protection of the watershed.

The main challenges faced by CRWA are climate change, stormwater pollution, cyanobacteria (blue-green algae), water quality, streamflow, and dams. To solve these issues, the association has set the following goals:

1. Restore natural hydrology within the urban environment.
2. Address new and mounting pressures due to climate change.
3. Use river science to measure current conditions and changes.
4. Advocate for a healthy, vibrant, and climate-resilient Charles River watershed for all.

Actions

To achieve the first goal, restore natural hydrology, CRWA has focused on designing natural green corridors and infrastructure that can soak up water and carry it slowly through the city. Retrofitting buildings, streets, and parking lots to capture and treat runoff, connect isolated greenspaces, and create greenways have led to coming closer to mimicking historic natural conditions.

Achieving the second goal encompassed the development of guidelines for green streets and green areas to be implemented by the city council. The guidelines focus mainly on the efficient management of stormwater through the increase of infiltration areas, stormwater treatment, promoting the slowing of stormwater run-off through city design features, and the efficient use of water regarding the choice of the plants in green areas and their location.

The Charles River Climate Compact was established to link all stakeholders, including elected municipal officers, and to jointly develop a common strategy for climate change resiliency.

An app was created to enable people to follow in detail their water consumption patterns and compare them with others, in order to create awareness and eventually reduce water consumption.

Monitoring water chemistry, pollutant levels, cyanobacteria algal blooms, stream flows, invertebrate species, and invasive plants as well as widely disseminating the results, goes towards promoting education and awareness (goal 3). The monitoring programme, on the other hand, has led to dam removals, invasive plant control, stream naturalisation, and fish stocking.

A wide programme for engaging residents as volunteer community scientists has helped to increase awareness, and to expand participation in on-the-ground projects.

The fourth goal resulted in the close collaboration with the city council to defend environmental justice, making sure that environmental laws are respected, and act as a voice of the river regarding the challenges that it faces currently and will potentially in the future.

Results

Over its 66 years' existence, the Charles River Project has led to the following results:

– The legal protection of large natural areas upstream.
– The first public river bath indicates that the dirty, polluted river belongs to the past.

– The promotion of canoe and kayak races.
– A dramatic reduction in sewage and bacteria.
– The creation of the Clean Charles Initiative by the city council and the combined sewer overflow programme based on science produced by CWRA.
– 20 years after the creation of the water quality report card, in 2014 the river waters obtained their first grade A.
– The City Council's legal street guide with CWRA as main technical advisor.
– CWRA leading the Regional Climate Action Coalition.

Remarks

This project was selected for its professional standards and 56-year experience in river protection. The wide range of initiatives, including the interactions with urban planning and advocacy for ecological enhancements and environmental education were an interesting feature. The widespread use of nature-based solutions and the inclusion of volunteers in some of the actions as well as the availability of detailed information about the myriad measures allow us to have a clear view of goals and results.

Further interesting features include the close collaboration between the council, with political entities, and residents; and being at the forefront of river science. The latest feature has led to the use of innovative materials and solutions, like porous asphalt, stormwater bioretention treatment or redirecting stormwater into strategically placed greenspaces. Another feature was pioneering on climate change threats and including this issue in many measures, as well as the creation of a regional coalition to fight the problems at a large scale, and protect the city.

2. Blue Loop

Project Name	The Friends of the Blue Loop
River name	River Don and Tinsley Canal
City, Country	Sheffield, UK
Website	https://www.facebook.com/theblueloop/ https://the-rsc.co.uk/riverlution/blue-loop

The Friends of the Blue Loop is a volunteer-led organisation focused on maintaining and improving an area known as the 'Blue Loop' in Sheffield, UK. The Blue Loop is a 13-km stretch of waterways of the river Don and the roughly parallel Tinsley Canal, from Sheffield City Centre to the neighbourhood of Meadowhall.

The canal opened in 1819 to enable navigation from the river Don to the new harbour in the centre of Sheffield. With a width of 4.65m, the canal was never enlarged, and is today with the river Don a relevant component of the green and blue infrastructure of Sheffield, offering walking, boating, wildlife-watching and all-round relaxation.

Working with the Canal & River Trust, the care activities of Friends include footpath maintenance, cutting and pruning vegetation, removing invasive plant species as well as trash, litter pick up from the footpaths and river/channel. Initiatives are organised at regular monthly intervals on the canal or riverbanks. The organisation provides, besides tools and equipment, training when necessary. The training sessions aim to enable the participants to look after the wildlife and habitats of the Blue Loop.

Remarks

As the Friends is a local, environmental conservation organisation, the information made available, outside of social media, is quite limited. Nevertheless, it is considered an interesting project, as it is promoted, led and put into practice exclusively by volunteers, in a continuous effort to protect and improve the Blue Loop's quality.

The regularity of initiatives and the training provided make it more likely to drive further interested volunteers to join, while the training support allows local people to gain valuable work experience and skills.

3. Brazilian Streams

Project Name	The contribution of volunteer-based monitoring data to the assessment of harmful phytoplankton blooms in Brazilian urban streams
River name	Brazilian streams
City, Country	Several cities in Brazil
Website	https://pubmed.ncbi.nlm.nih.gov/28169029/

This academic project covered the analysis of 64 rivers in Brazilian urban areas, and was focused on producing scientific information on water quality, with the help of volunteers. The study aimed to identify potential drivers of the phytoplankton community and determine thresholds for cyanobacteria development. Volunteers helped to detect the turbidity in each stream using colorimetric and optical methods, and recorded environmental conditions in the immediate surroundings of the sites through visual observations, according to the authors.

The evaluation of the benefits of a volunteer-based monitoring to support decision making was also part of the project. The analysed dimensions were water turbidity and chemical characteristics of the sampling collected between the dry (July 2013 and July 2015) and warm (February and November 2014) seasons. The results reinforced the need for nutrient abatement and restoration of local streams. They also highlighted the benefits of volunteer-based monitoring to support tackling the research goals and to enlarge the research base.

Remarks

The project is interesting for the mixed-method it included in the research design. Being an academic project, it focused on creating sound information with the overarching aim to inform decision making.

Another interesting feature is the inclusion of citizen science as part of this project's structure, and the combination of data collected by scientists and volunteers. The inclusion of volunteers enabled a wide range of cases (64 urban streams) and datasets (n=117) to be integrated. The results highlighted the benefits of volunteer-based research and the successful collection of data to increase the data-base so that a threshold for cyanobacteria blooms could be established.

4. A walking workshop along the river Auji

Project Name	Applying Urban Tinkering principles in Kisumu: A walking workshop along the River Auji
River name	Auji
Country, City	Kisumu, Kenya
Website	https://cbc.iclei.org/applying-urban-tinkering-principles-in-kisumu-a-walking-workshop-along-auji-river

This project focuses on the River Auji in Kisumu, Kenya's third largest city. The project is part of The Urban Natural Assets for Africa: Rivers for Life (UNA Rivers[4]), an initiative coordinated by ICLEI (Local Governments for Sustainability), which with the focus on restoration and revitalization of rivers in cities aims to bring together communities, local and regional government, researchers and urban planners. In workshops stakeholders identify challenges and develop solutions to urban problems. Based on urban tinkering principles, a three-day workshop was organised involving different stakeholders.

Tinkering, as advocated by ICLEI[5], is an alternative approach to planning. It combines approaching living systems with the built environment together in order to increase the quality of existing landscapes through small-scale "urban experiments". In the Auji, the workshop consisted of walking together along a 3km stretch of the river, and developing solutions for identified sites to overcome urgent challenges. The overarching aim was to initiate shifts in the way rivers are treated and adopt alternative perspectives.

[4] https://cbc.iclei.org/urban-natural-assets/

[5] https://africa.iclei.org/posters_infographics/urban-tinkering-an-alternative-approach/

Results

Collective insights helped to generate innovative ideas for tackling the recurring flooding, and this with low-cost, nature-based solutions that can be implemented by the riverain population over time. ICLEI lists the following results:

- Integration of grey, green and blue infrastructures – this enables a more powerful and integrated identification of citizens' needs and expectations.
- With the "safe-to-fail" approach, tackling the issues from a variety of angles and stakeholders' views decreased expectations, but also increased the awareness that some initiatives might fail.
- Bringing different stakeholders - with different kinds of knowledge and experience - to walk together along the river resulted in many different perspectives and expanded the discussion over other, partly controversial, challenges. One quoted example refers to the idea of covering part of the river to prevent illegal dumping. This raised concerns about the loss of plant species that help clean and purify the river water.
- Building on what you have on the ground – this principle is used to value the local landscape and local knowledge, and from there to create innovative and context specific solutions. One group discussion was directed at raising awareness of the impact of pollution and garbage dumping in and round the stream, as these have direct consequences for people's own well-being.
- Everyone and every idea count - making clear this issue proved to be an asset to pooling experiences and practical knowledge. This also enabled the development of ideas on reusing existing urban elements to serve multiple, often unrelated, functions.
- Informality, which is a common feature of urban processes in Africa, has to be seen as an opportunity, especially where planning and infrastructure do not keep pace with the rapid urbanisation. Tinkering, as advocated, unlocks the innovation in informality and allows for greater levels of flexibility and adaptability in planning.

Remarks

Introducing Tinkering to one of the poorest communities in Kenya, along with valuing the local situation and knowledge led to a different approach to river restoration. The low financial support forced the participants to develop a set of measures that recycles structures and materials available on site, and to be creative with existing infrastructures.

Another interesting fact is the concept of bringing together different stakeholders (communities, local and regional government, researchers and urban planners) and together identifying challenges and developing solutions on site. This is an interesting and seemingly productive concept. Unfortunately, there is no further information on when the workshop took place nor on future plans or discussed implementation ideas.

5. Raising Awareness on Rivers and the Environment

Project Name	Innovative ways of engaging with communities on the importance of rivers
River name	Malawian rivers
City, Country	Lilongwe, Malawi
Website	https://cbc.iclei.org/innovative-ways-engaging-communities-importance-rivers/

This project carried out in Lilongwe, the capital city of Malawi, focused on environmental education and raising the population's interest in protecting the rivers through the creation and spread of the song "Rivers for Life" (trans. from Chichewa). The project was promoted by ICLEI, an NGO based in South Africa that provides technical consulting to local governments to meet sustainability objectives. This project, like the above described Auji River Project, was also developed under the UNA (Urban Natural Assets) programme.

The lyrics of "Rivers for life" tackles the value of urban rivers and the need to protect them. The renowned Malawian singer-songwriter Lulu wrote and produced it. On 12 June 2018 the music video was launched in Lilongwe, after Lulu and the UNA Rivers project entered into a partnership to raise awareness about the importance of rivers in cities.

The lyrics of the song and the upbeat rhumba rhythmics quickly became a great success, turning Lulu into a sort of ambassador for the project.

Results

The song was broadcasted first by using a common way to share information in Malawi: cars moved around with the song blasting from the speakers. Also 2,000 CDs were distributed in different areas of the city. The song was also handed over to "burn centres", which in Malawi, according to this project, store and sell songs to local communities. Thus, they are the most effective way of engaging with the masses. Here songs were loaded directly onto cell phones and USB flash sticks.

Through a live performance, the song was officially launched in a press event, attended by community members, politicians, newspapers and radio stations reporters. The event was also used to spread information about the UNA Rivers project and the value of nature in urban settings. The event was showcased on three local radio channels and in newspapers. According to ICLEI, until 2019 the song has had more than 6,000 downloads, and more than 8,000 views on Youtube.

ICLEI reports an informal indicator, namely when its team heard the song on the taxi trip to the airport. Upon the recommendation of a friend, the taxi driver had downloaded and listened to the song.

Remarks

Although the Project focused on the (limited) goals of increasing environmental education and awareness on urban rivers in general, it stands out for its innovative and practical approach. Making use of the local infrastructure, the project acted on the first step of river regeneration, which is raising community's awareness, and did this through music.

Since the concern was to reach the largest number of people possible, the project's response is a creative and effective approach. As music can be considered a great means of communication, it can help raise awareness in that it reaches – mostly unconsciously – the heart of people.

6. Mystic River

Project Name	Protect and Restore the Mystic River
River name	Mystic River
City, Country	Boston, USA
Website	https://mysticriver.org

This project concerns the restoration of the Mystic River Watershed, located on the East coast of the USA. The watershed comprises a network of rivers, streams and lakes that drain into the Mystic River. With around 600,000 people living in 21 different communities in the watershed area, the area and the rivers suffer from the harmful effects of urban growth.

To protect and restore the watershed, MRWA (Mystic River Watershed Association) was created to address the following issues on a long-term basis:

1. Provide environmental education
2. Improve greenways
3. Monitor the herring population
4. Combat invasive plants
5. Increase climate resilience and water quality
6. Reduce trash flowing down the rivers.

Results

In order to achieve the goal of improving education and raising awareness about the Mystic River watershed, the association has developed formal education programmes for school and youth groups. The programmes explore the different values and challenges of the watershed in a fun and interactive way. Such programmes can be purchased by schools and educators.

The greenways initiative aims to protect the river banks and the riparian vegetation and to foster the construction of around 40 km of pathways. Several projects that together form the Greenway are currently in the design and construction phase.

The goal of monitoring herring comes into practice with the help of volunteers. They come together between April and June to count and record the number of herring moving towards the traditional spawning areas. This data is used by the Division of Marine Fisheries to estimate herring population size. In 2017 the association also installed an underwater fish cam and an online counting platform to gather more data about the number and behaviour of herring.

Volunteer resources are also used for invasive plant control. They report sightings of invasive plants and animals and take part in actions to remove them. Over 1,000 volunteers are engaged in the two management programmes to tackle key invasive species, one dedicated to invasive aquatic plants, and the second to invasive species in waterfront parks.

MRWA addresses climate change with 3 different initiatives: 1) The fund-raising programme Resilient Mystic Collaborative gathered support and collaboration from organisations and business leaders from 19 out of the 21 communities in the Mystic River watershed and raised over $1.7 million for regional climate resilience projects. 2) The volunteer-based campaign The Wicked Hot Mystic helps to identify heat islands and cooler areas through heat mapping. This mapping supports planning decisions and prevents potential health impacts of extreme heat on people. 3) Green Infrastructure projects to manage stormwater impacts. MRWA is working with municipalities to create more nature-based solutions throughout the watershed, such as bioretention swells, trenches and stormwater wetlands.

The Trash Free Mystic programme consists of several actions. It starts with a series of webinars in April and May for municipal staff and volunteers on measures and best practices on tackling the problem of trash in rivers. Trash booms were installed to block trash from flowing down the rivers. These serve as an educational tool and as a monitoring tool to start measuring the amount of plastic entering the stormwater system. Trash assessments, undertaken with help of volunteers, record data in order to detect the source of water-borne trash.

Remarks

The special feature of this project is its holistic approach and the strong involvement of volunteers, engaged and coordinated by an Association. The growth in terms of results and volunteers involved is a matter of professional guidance, derived from setting up several programmes every year. The results are, on the one hand, a significant improvement in the health and aesthetics of the river, and, on the other, increased experience and financial availability to back the actions.

These factors, together with the range of actions and their different strategies, put this project at the forefront of river restoration. The strong integration of nature-based solutions and volunteer involvement were also key points.

Once again controlling invasive species, and collecting observational data on species by training and empowering environmental stakeholders bear good fruits. The

engagement of volunteers to map temperature around the city, aimed at informing public policies to mitigate the effects of heat islands, and transform the watershed into a cool, pleasant area of the city, is another example of how engaging people with their environment is put into practice.

7. River Irk

Project Name	Bringing the River Irk to Life
River name	River Irk
City, Country	Manchester, UK
Website	https://naturalcourse.co.uk/2021/01/04/project-update-bringing-the-river-irk-to-life-bril/

The River Irk runs from the outskirts to the Manchester city centre. According to the project, the Irk is mostly a neglected and unloved channel. The Natural Course programme, funded by the EU Life IP project, is developing the action plan "Bring the River Irk Back to Life" aiming at transforming the river corridor into an environment people will want to live and work in as well as visit. Greenspaces are planned to provide places for well-being and recreation along a cleaner and more natural river, one which will be, where possible, reconnected to its flood plain. Throughout the river catchment these measures will result in connected habitats where wildlife might thrive, and with fewer threats to migrating fish. Another goal is to get the river corridor recognised as an asset and this to be reflected in protection and enhancement through the land use planning and regional development process.

Actions

The first action of the project was to open a discussion about the River Irk. Over time, the collected opinions were collated into a list of potential actions that could help improve the Irk for both the environment and people. In March 2021 workshops with stakeholders from the public, private and community sectors further developed the action list into a shared vision for the River Irk.

An online tool was created to enable the community to report the issues they identify in the river and along its corridor. The tool contains maps showing the current ecological status of the rivers in the Irk catchment, as well as opportunities/solutions identified so far.

Results

The development of the Action Plan is an ongoing process, and a new update has been issued in October 2021. According to the available information, 161 stakeholders participated in a workshop in March 2021 and analysed the locations of existing or proposed schemes, and the potential opportunities to increase the

Action Plan. Some priorities were defined in the workshop:

- Re-naturalization, better access to and reconnecting the river with the city and surroundings
- Transforming the Irk so it becomes the "people's river".
- Supporting planning policies and decisions that promote more investment in green and blue infrastructure.
- Cleaner water, less rubbish and more wildlife.

The list of mentioned problems includes weirs and culverts, invasive alien species and the loss of biodiversity, artificial channel, poor water quality and other nuisances, such as litter, sewage and unpleasant smell, as well as the disconnection of the river from the floodplain.

The consultation resulted in 13 initiatives. Across the catchment, they ranged from litter picking to the development of plans for the removal of a weir or the construction of bypass channel to aid fish passage, the creation of wetland, and control of discharged sewage to improve water quality.

Remarks

This project is quite unique regarding the importance of the community's involvement in vital parts of an action plan: in the identification of problems and challenges as well as in prioritising the measures. According to the information released by the project promoter, engaging a wide range of stakeholders is the key source of information and knowledge for the elaboration of the action plan.

Another interesting feature is the innovative way in which the community became engaged, namely through the creation of an online platform with a detailed map of the river and its features, making it easy to visually explore the areas. This led to an effective submission of identified problems and suggested solutions. Such a working approach reinforces the use of local knowledge and skills.

8. River Torca

Project Name	Elementos de recuperación de ríos urbanos
River name	River Torca
City, Country	Bogotá, Colombia
Website	

The River Torca runs for approximately 14 km though the city of Bogotá, Colombia, and drains an area of 1,400 ha. It is a tributary of the River Bogotá. Originally the Torca was part of a vast wetland system extremely rich in biodiversity. Over the years, though, part of its course has been channelised, and experienced a dramatic decrease in its ecological, aesthetic and social values (Quintero et al., 2011). This

project proposes a new way of looking at the river, presenting a very complex action plan for its renewal. The plan was developed at the University Antonio Nariño (Bogotá), by an interdisciplinary team composed of experts in biology, urban sanitation, hydraulic and environmental engineering, social services, architecture and urban planning and design.

The goals set are:

1. Naturalise the riverbed and its surroundings.
2. Improve landscape and aesthetic values.
3. Promote biological diversity and improve riparian habitats.
4. Increase the sustainability and autonomous regeneration of fluvial ecosystem.
5. Improve water quality and its drainage capacity.
6. Promote a better interconnection of the community with the river in a safe way.

Actions

The proposed actions targeted three major topics:

– Revegetation of riverbanks
– Community engagement
– Landscape and urban design

Revegetation - The proposed process of revegetation consisted of mapping the existing riparian vegetation, and inventorying the plant species on the riverbed and around it. This enabled a good overview of endemic and exotic species. The plan suggests reintroducing native riparian species as well as low maintenance non-riparian species among the already existing vegetation, following Bogotá's guideline for urban forest management. The revegetation measures aim to increase ecological dynamics and aesthetical value as well as waterflow.

Community Engagement - To facilitate the community engagement, street stands were located along the river with detailed information of the past of the river and its future design. Other mobile stands with information about the environment and native/exotic plants were installed in order to promote further activities, such as garbage cleaning or a thematic carnival parade. Another quoted example is the stand to raise awareness of the amount of garbage in the Torca and the need to recycle the solid waste thrown in the river.

Landscape and Urban design - This topic is where most of the content about the project is available. The project produced dozens of maps and design images where the planned intervention for each part of the river is clearly visible. The maps also display existing facilities and opportunities, such as urban art, playgrounds, events areas and workout areas. The whole riverbed will be transformed into a linear park with pedestrian walkways, jogging paths and cycle lanes. Regarding ecology and the environment, together with the above-mentioned revegetation of the riverbed, the implementation of this new park will work as a link, a bioecological corridor

between the city and the mountains around it. Bird watching spots and ecological information panels are also proposed.

Finally, the project suggests the protection of the riverbed and the riparian vegetation to limit urban expansion.

Results

The main result of this project is the unprecedented complete in-depth study of the existing challenges and possibilities to regenerate a river under urban pressure. The decision of what and where to implement the different facilities, public services as well as vegetation, is taken based on sound local knowledge. This enables the proper integration of all individual measures.

The well-prepared visual aids, storytelling with easy-to-understand visualisations and dashboards proved quite relevant, as they allow anyone to understand the ideas and the expected results. Such visual means are of immense value to decision makers and, in the end, to the community.

In the field, the only actions that were put in place are the two days of solid waste removal, a poster with environmental information, four events held with 48 specialised environmental promoters, and the thematic carnival parade.

Altogether, 170 members of the community of Usaquén, the neighbourhood which the river crosses, got involved.

Remarks

This project is included in the list because it represents a perfect combination of the scientific and academic methodology with the practical approach of a restoration plan to be presented to decision makers. The integration of state-of-the-art approaches with new concepts from different disciplines and expertise make the plan for the Torca restoration an interesting project. The interventions backed by a nature-based concept and some methods to foster community engagement in the whole process, makes the project a great fit for the group of cases studied.

Another interesting feature is the visual aids, such as maps and different perspective views, created to display the planned measures.

Unfortunately, there is no information about the implementation of this project.

9. Manuelzão Project

Project Name	Manuelzão Project
River name	Rio das Velhas
City, Country	Belo Horizonte, Brazil
Website	https://manuelzao.ufmg.br

The Manuelzão project has been working continuously on the restoration of Rio das Velhas, in the state of Minas Gerais, Brazil, since 1997. This river has a basin of 29,173 km2 and crosses 51 municipalities that together gather around 5 million people and contribute 62% of the whole state's GDP. When the Rio das Velhas flows through the city of Belo Horizonte, the state capital, it is already highly affected by human activities and urbanisation.

The project was first founded by a group of professors from the Medicine Faculty of the Minas Gerais Federal University. The project roots were laid out by public health issues, as its backbone was an upgrading in the provision of health and preventive medicine services for specific riverain communities. Medicine professors and students launched a movement to treat the single source of many illnesses in the region: the pollution in the Rio das Velhas.

The central goal of the project is to improve the river's environmental conditions with a view to increasing health conditions and quality of life of riverain communities. It started in 2003 with the programme "meta 2010", setting the following general goals: to make sailing, fishing and swimming possible in the river again; to connect the community with the river and raise awareness among the community to the value of the river.

In order to effectively have an impact on each section of the river, the project created local committees, each one responsible for a different area of the river basin. Each committee involved the participation of community members, local politicians and other stakeholders. A multi-disciplinary Mobilization and Education Group provides guidance and support for each committee.

Actions/Results

The project's focus is mostly on raising awareness and on environmental education. The "Manuelzão goes to school" initiative was created by the central coordination and then applied locally by the committees, thus covering the whole river basin area. The action consists of introducing river protection awareness in schools situated around the river basin. Further initiatives, such as seminars, workshops, mini expeditions, were also offered as school activities.

One of the most successful actions was a river expedition in 2006. A kayak trip and a hiking group down the 804 km of the river were ideal to attract the attention of a large number of people. The crowd gathered along the river to watch the kayakers. During the trip, further awareness-raising events were organised, such as presentations, cultural activities and small hiking trips. Also, the unique experience of both groups made them exceptionally aware of the river issues. They are considered multipliers for future actions. Another successful initiative reported is the "Festivelhas", a 5-day festival to celebrate the cultural and artistic diversity and wealth of the riverain population. Here, too, the environmental and educational component was a central component.

The project also carries out a water quality monitoring programme, the results of which are widely disseminated.

Locally, each committee organises several initiatives in their areas, which include:

- Mapping biodiversity along the river and in backyards, in partnership with the University.
- Technical supervision for housing construction.
- Creation of a linear ecological park in Belo Horizonte.
- Support for the city council in projects that have an impact on the river basin.
- Establishing bioretention areas as sewage treatment.
- Garbage removal and replanting riparian species.
- Support for recycling and selling reusable bags.

Remarks

This project is interesting especially for its scale and structure. The local committee strategy, working like a franchise, seems to be effective in engaging local stakeholders in problem solving related to their neighbourhood, while relying on a comprehensive and specialised guidance and advice from the central organisation/university. This allows the project to implement and disseminate the actions across a large portion of the river basin.

This project goes well beyond raising awareness and environmental education; it has found some creative forms of directing attention to their issues, namely, the river expeditions and festivals.

It is a comprehensive project as it manages not only to involve the riverain communities' actions, but also influence policy making.

10. Manzanares River

Project Name	Plan de Renaturalización del Rio Manzanares a su Paso por la Ciudad de Madrid
River name	River Manzanares
City, Country	Madrid, Spain
Website	https://www.ecologistasenaccion.org/32924/

This project tackles the restoration of the River Manzanares on its passage by the capital city of Spain, Madrid. As a typical Mediterranean river, it has limited flow rates, particularly in the summer. To respond to the intense urbanisation throughout the 20th C, the river has been set in a concrete canal, its flow dramatically changed by water retention sluice gates. These changes have strongly reduced its ecological function as well as its aesthetic and social value.

In 2004 the organisation Ecologistas en Acción (Ecologists in action) submitted a restoration plan to the city council of Madrid. The city council, backed by that plan,

created its own project in order to conform to European legislation and the Spanish national strategy for river restoration, and in 2008 came up with a final document to guide the restoration of the Manzanares. This had the following goals:

1. Functionally reconnect the river with the city, and restore its environmental and social quality.
2. Restore original landscape elements and structures typical of Mediterranean riparian zones and create new greenspaces along the banks.
3. Partially restore natural fluvial hydrodynamics.
4. Improve riparian ecosystems and lateral connection of the river with the tributaries.
5. Improve the ecological corridor function of the river, connecting habitats from upstream and downstream.

Actions/Results

To achieve these goals the following initiatives were undertaken:

Morphology, Vegetation and Fauna – to improve water conditions, pollutant sources were removed and where possible the bank's topography was changed. Opening holes in the channel walls and removing exotic species allowed the revegetation of river slopes with trees and bushes typical of riparian thickets.

Social Use – transforming the riverbanks into meeting places for citizens with Riverbank balconies, walking paths and cycle lanes; linking the river to other leisure, sports and cultural facilities in the city.

Fluvial hydrodynamics – the permanent opening of the water retention gates, and the introduction of deflectors changed the flow dynamics for a more natural performance.

Indicators

The main indicators of change are mostly linked with the restoration of the natural hydrodynamics of the river. The opening of the retention gates led to the spontaneous formation of sediment islands, where native plant species, shrubs and even trees found a habitat. This is working as a basis to greatly change the biodiversity and can be taken as an indicator for the river as a green corridor. Also reported is an increase in native birds and fish species; the return of otters, which had been absent for 50 years, is an indicator that the river is healthy again. Water and odour quality as well as landscape aesthetics have also been clearly improved.

Remarks

This project was implemented in an interesting way, with a strong community-linked organisation, Ecologistas en Acción, creating and submitting a restoration plan to the city council. From another perspective, the plan fell on understanding ears at the city council, which provided the financial resources to put such a huge project into practice.

Another interesting feature of this project was how a simple nature-based solution like restoring the natural hydrodynamics of the river had such a significant impact on its ecological improvement, backed up by impressive biodiversity indicators.

11. River Sokolówka

Project Name	Urban river restoration: a sustainable strategy for storm-water management in Lodz, Poland
River name	River Sokolówka
City, Country	Lodz, Poland
Website	https://climate-adapt.eea.europa.eu/metadata/case-studies/urban-river-restoration-a-sustainable-strategy-for-storm-water-management-in-lodz-poland

The River Sokolówka runs through the city of Lodz, Poland, and is described as highly influenced by the city's heavy urbanisation process, in particular in the 19th century, when the textile industry expanded in the city. Like most of the urban watercourses in the region, the River Sokolówka was regulated and canalised. Nowadays its flow depends mostly on all the run-off water coming from the high number of impermeable surfaces in the city (Wagner et at., 2007). Serious flooding events and high pollution levels have been the results. The lack of greenspaces and open waterways are problems identified in the city, thereby contributing to a decreased quality of life for citizens and the raising of urban heat island effect.

To answer these challenges, a restoration plan was developed by the SWITCH Project - a partnership of 33 organisations from 15 different countries, focused on scientific, technological and socio-economic innovation for a sustainable management of water in the "City of the Future" (Hoyer et al., 2011). The restoration plan aimed at regenerating the river to reduce flood risks and improve the urban ecosystem, and with these ameliorate the microclimate. The Sokolówka project is a testbed for a number of ideas developed by SWITCH while acting as an example of strategy to be implemented by city councils.

The Sokolówka project was developed based on the Blue-Green Network and nature-based concepts. It assumes that rivers and greenspaces have to be connected to the city and its development processes. Through the project, a framework for river management should be put in place, tackling the retainment of rainwater, increasing green infrastructure, encouraging healthy lifestyles, attracting businesses, and making the city more resilient to global climate change.

Actions

The adopted solutions for the restoration of the Sokolówka include strong stakeholder involvement through the creation of a "learning alliance". This concept

consists of a stakeholder forum for exchanging ideas, plans and interests. At its peak, the key stakeholders in the Lodz Learning Alliance had partners from 25 different organisations, including political power, local water management and treatment companies and agencies, research institutes and several NGOs (Wagner et al., 2007). Apart from the "heavy weights" in this alliance, there were several forms of community participation, i.e. meetings, trainings and workshops. Workshops with young people were organised to raise their awareness of environmental issues and to create interest in the city's hidden rivers.

Acquired baseline data (e.g. chemical analysis of water and sediments, biological and ecological data, and models for stormwater management) provided the SWITCH project and the learning alliance with a sound foundation to develop appropriate measures. The regeneration plan included the design and construction of three stormwater reservoirs (completed in 2006, 2009 and 2010) and a sequential sedimentation bio-filtration system for stormwater purification (completed in 2011), which was patented by SWITCH.

Results

Renaturing the riverbed with a meandering canal with biofiltration system, as well as ponds and reservoirs placed in series help:

- Regulate the flow peak and thus reduce extreme flows, increase water retention in the city, improve water quality, and increase groundwater level.
- create new habitats for fauna and flora - increased water quality and new ecotone zones are associated with enriching the urban landscape and creating new aesthetic values along the river corridor.
- Create a healthier urban environment by improving and incorporating the blue-green network into the city.

The pilot and the restoration activities were considered a success, since the Lodz city council and water management agencies, acknowledging the results, plan to expand the measures through a project called Sokołówka Valley, and to connect the renatured area with parks and greenspaces through an ecosystem themed educational path and bike lanes. The Sokołówka model was also replicated on the Arturówek, Lódz reservoirs under the EU Life+ programme.

Remarks

Integrating nature-based solutions into infrastructure projects as main strategy sets the Sokołówka project as a flagship for joint initiatives. The measures for increasing the city's environmental response associated with the learning alliance programme, which gathered key stakeholders, are a particular output of this restoration plan design. The availability of detailed information about this project and the fact that it had a focus on innovation and replicability were other remarkably interesting factors.

12. Rios Project

Project Name	Rios Project
River name	Several rivers in Portugal
City, Country	Portugal
Website	https://aspea.org/index.php/pt/projeto-rios-conhecer

The concept adopted by the Rios Project in 2006 was originally created and implemented in Catalonia, Spain and then replicated in Portugal by the Portuguese Association of Environmental Education (ASPEA). This project aims to make community participation a crucial part of river conservation and management. The idea of bringing this project to Portugal derives from the visible deterioration of rivers and the clear lack of involvement of the populations in their recovery.

The project focuses on environmental education and awareness raising. Through different initiatives, it aims to arouse curiosity and change people's minds to take an active role to promote a better future for rivers.

Actions

Open to any person or entity (i.e. councils, parishes, agencies, schools, companies, etc.) interested in the subject, this project aims to bring a group of people together to volunteer in environmental actions (management of natural resources, waste and biodiversity related to water management). Each group assumes the care of a 500m section of a river, adopting this stretch to develop an action plan jointly. In this way, through the active involvement of the community, the project aims to cover as much of the Portuguese rivers as possible.

The local actions of each group are supported by the technical staff of ASPEA, therefore differing for each stretch of river. Among the common activities that should be mentioned are workshops, seminars, monitoring courses, development of communication material, river valley clean-up days, exotic species removal, and monitoring walks around the adopted areas.

Results

Among the several activities carried out, the most important are the series of lectures throughout Portugal, the monitoring of field trips, and the training courses for monitors.

The National Meeting of the Rios Project and "Portuguese rivers in motion" are events aimed at bringing the groups together to exchange experiences and to disseminate the initiatives.

Apart from all the results linked with the actions in the different sections, between 2006 and 2019 this project has published several indicators of their practical outcome:

– 577 river sections adopted in 141 different municipalities.
– 289 km of rivers adopted.
– 730 environmental monitors trained in 45 courses
– 5,165 Facebook followers.
– More than 50,000 people were involved in the activities.

Remarks

This project is interesting for its effective and wide-ranging concept. The way it is organised efficiently promotes community engagement, as each group is responsible for environmental actions in the adopted section.

The extension of activities and the territory covered by the project are quite remarkable.

On the other hand, the focus on education and awareness as part of river management attracts most attention, maybe putting ecological restoration, landscape management, and improvements in water quality to one side. Reasons for this could be the fact that the project is coordinated by an environmental education association. However, this fact does not diminish the results, since other improvements need much more effort, and raising awareness, as already stressed, is the first step to change people's mind. Most participants come from local associations (101) and schools (331), and this is an impressive outcome.

13. Os Nossos Rios

Project Name	Os Nossos Rios
River name	Rivers of the municipality of Vila Nova de Famalicão
City, Country	Vila Nova de Famalicão, Portugal
Website	https://enea.apambiente.pt/content/os-nossos-rios

The project "Our Rivers" is promoted by the Portuguese Environment Agency in collaboration with the Ministry of Education and the city council of Vila Nova de Famalicão. Creating awareness for riparian systems and promoting environmental education is at the core of the project. It is financed by the environmental fund "National Strategy for Environmental Education 2020 (ENEA)".

The goals are as follows:

– Increase the skills of municipal staff regarding the protection.
– Create a municipal programme of environmental education and motivate target audiences to transfer knowledge for potential multiplier effects.
– Develop workshops focused on capacity building for key stakeholders to support the protection and management of water resources.
– Create a pilot area to demonstrate best river management practices.

Actions/Results

The actions of this project are divided into 4 major areas:

Active public participation – with initiatives such as garbage removal, control of invasive species, planting riparian trees and shrubs, and water quality monitoring; as well as on-site seminars to demonstrate the values of the measures.

Multiplying effect – with workshops and seminars to discuss river restoration techniques and how to gain support from the population; and to increase the staff's skills to monitor and maintain the restored sections.

Environmental awareness – this encompasses different actions to promote interaction with the riparian thickets and vegetation, the need to bring out behavioural changes in treating rivers, and the production of didactic and communication materials to promote the project and its results.

A total of 3,157 people were involved in the project through social media, and another 725 people acquired skills regarding river conservation and management. Another interesting outcome was the replicability of the methodology used, which can be used by other agents or councils.

Within the scope of the project, a memorandum has been signed with a set of personal, community and political commitments regarding the valorisation of the municipality's waterways.

Remarks

This project is interesting for its smaller, but efficient, structure. As it is promoted by a city council and national agencies, it already has the necessary support. Its concept is easily replicable by other communities.

A strong focus on community participation is reinforced by conducting a pilot. This not only serves to demonstrate the value of the measures but also to improve municipal staff's skills.

14. H2Óctogono Azul

Project Name	H2Octógno Azul – Vamos Adotar o nosso Rio Paiva
River name	River Paiva
City, Country	Viseu, Portugal
Website	https://enea.apambiente.pt/content/h2oct%C3%B3gono-azul-%E2%80%93-vamos-adotar-o-nosso-rio-pavia

The River Paiva, with a strong seasonal and annual variation in water flow, runs through the city of Viseu and has an historic reputation for being badly polluted. Industrial discharges made directly into the river are the main pollution sources.

The river never played an important role in the city and has been totally neglected by its urbanisation process and, consequently, its community. This project was promoted by the local Alves Martins high school and developed by students in the year 2018, with the goal of keeping the project alive for the following years. Being a school project, the focus was on education and awareness of river challenges, restoration techniques, and how these could consequently create a multiplier effect in the community in general.

Actions

The methodology used to achieve the goals had a special focus on water quality. During the implementation process, the field work in six different periods, according to waterflow, the students were in 3 different spots of the river (upstream, in the city and downstream) and measured and analysed the water quality. The measurement included recording GPS coordinates, photographing different situations, monitoring meteorologic conditions, and collecting samples for onsite dissolved oxygen analysis, physic-chemical analyses of water (temperature, pH, conductivity, redox potential and turbidity). The physic-chemical analysis was then repeated in the laboratory.

At the end of the work, there was an interactive session with all participants in order to present and discuss the results. In two public sessions, one for the school community and the other for the general public, the project results were presented. The analyses and indicators were presented using the 8 parameters of water quality (PH, nitrates, conductivity, etc.), visually represented by a drop of water coloured differently depending on the result, blue for high values and red for low. All the drops (parameters) put together side by side created an octagon. If all parameters were very good the whole octagon turned blue; the contrary situation created a red octagon, like a stop sign.

Results

The disseminated results are linked to the increase in awareness of the importance of water resources, and in the skills of the students involved. Information materials and a scientific report have been published, and a temporary exhibition was organised in the school courtyard.

Remarks

This project was selected because of its interesting approach to the dissemination and communication of the results. The design of visually arresting graphics, such as the octagon of the drops of water indicating water quality, resulted in easy viewing and understanding of the issues of water quality. It is a creative and attractive form of engaging the community.

Another interesting factor is the fact that the project was totally promoted by a high school with the technical support of researchers of the Polytechnic Institute of Viseu.

15. Cascais Streams

Project Name	Ribeiras de Cascais
River name	Streams in the Cascais Municipality
City, Country	Cascais, Portugal
Website	https://ambiente.cascais.pt/pt/projetos/ribeiras-cascais

This project, initiated by the city council, aims at improving the ecological performance of the streams in the municipality. Cascais is part of the metropolitan area of Lisbon and is an important tourist destination, thus it is affected by urbanisation pressure. This, in turn, resulted in negative impacts on the streams. The project started in 2014, led by the Environmental Protection Department of the city hall and focuses on the ecological restoration of streams. A list of critically endangered endemic riparian species was the trigger of the project. Acknowledging the decrease in ecological quality of this streams, the city council decided to protect such valuable natural resources and set the following goals:

– Map biodiversity, stream habitats and disturbed riparian forest areas in the municipality.
– Update and enhance the knowledge base on the biotic and abiotic characteristics of streams.
– Develop measures for river ecosystems restoration.
– Control nonindigenous invasive species, and revegetate with endemic species.

Actions

The above-mentioned goals led to several actions, including:

– Mapping the riparian forests, monitoring and developing measures to restore them.
– Monitoring water flow and fish fauna, evaluating water quality.
– Controlling and eradicating invasive and exotic plant species in riparian zones, and planting native species.

These measures were supported by extensive communication and information activities, which included a wide distribution of information brochures, site information boards and an exhibition on the natural heritage of the Cascais rivers.

Voluntary programmes for garbage picking and control of invasive species enabled community participation.

Results

The implemented measures resulted in improvements in streams and adjacent areas. Several positive indicators were recorded:

– Counting species population (10,000 fishes, including endangered species, and 45,000 invertebrates).

– 343 volunteers participated in eleven initiatives, with 610 kg of waste collected.
– Mapping flora and fauna along 3,94 ha of streams and areas for the control of invasive and exotic species, and planting native species, 1,125 planted species in the Ribeira das Vinhas stream, and around 1,000 invasive crayfish removed.
– In 2018 this project received co-financing from the national programme POSEUR (Operational Programme for Sustainability and Efficient Use of Resources).

Remarks

Unlike the other Portuguese cases, which have a stronger focus on education and awareness, this Project has a very practical and efficient focus on ecological restoration, although the involvement of the community is not one strength of the project. It uses nature-based associated low-cost methodology, which seems to be efficient and easily replicable. The performance indicators make it an interesting case.

DISCUSSION OF RESULTS

This section outlines key issues and provides analysis, review and interpretation of the selected cases. This step involves a systematic identification of these key issues, common in most cases, and a reflection on them in an aggregated form.

Most prevalent issues are *Terminology* (the terms used in the cases, in particular how engaging (riverain) communities and stakeholders are referred to); *Coordination* (the management structures, project initiator/promoter, how power structures are devised), *Goal-setting* (specific goals defined by the projects); *Community Engagement* (the levels of community integration and stakeholders participation in the actions); *Approaches and Methods* (the application of frameworks to achieve the goals); and the combination of *Nature-based Solutions and Public Participation* (actions that support the integration of a community-based approach in removing sources of disturbance through nature-based solutions). When relevant, the analysis also distinguishes between national (Portuguese) and international cases and outcomes, since the premises and results are relevant for the development of a knowledge-base for the research group CIDATE.

The key issues are also considered both as priority and opportunities to improve the environmental quality of urban areas, and increase the level of public awareness of ecological issues. Table 2 summarises the measures adopted by the cases and how the community was involved.

	Main guidelines		Measures
Structure	Integration of local communities during the project design phase		• Through interactive digital platforms (River Irk) • Stakeholder meetings with community representants (River Auji) • Community workshops on site to identify problems and develop solutions (River Torca)
	Creation of a replicable and preferably scalable concept		• Creation of autonomous groups, with professional coordination (academic, organizations, etc.), on different rivers, or stretches of the river, with different stakeholders, including politicians (Rio das Velhas) • Creation of incentive programmes where different entities can apply to adopt a stretch of river and, according to the guidelines, develop a restoration plan (Rios Project) • Making the approach more professional as a long-term continuous job with skilled officers/engaged participants (Charles, Mystic, Rio das Velhas)
Goals	Foster community involvement		• Education and awareness raising • Participative design • Volunteering programmes for fieldwork
	Further ecological restoration		• Water monitoring • Habitat restoration • Ecological balance and improvement • Creation of greenways/corridors for ecological connection
	Enhance quality of life		• Climate change programme • Parks, paths and leisure facilities • Landscape values • Public health
Community Involvement	Project design		• Using interactive digital platforms • Stakeholder meetings with community and council representatives • Workshops on site
	Application		• Volunteering programmes (Charles River, Mystic River, Brazilian streams and Cascais streams) • Community is the main promoter (with professional coordination)
	Communication		• Thematic festivals/events (Rio Torca and Rio das Velhas) • Use of "influencers" (river Lilongwe) • Thematic river expeditions (Rio das Velhas) • Information centres (Rio Torca)
	Long-term sustainability		• Information centres • Social mapping to identify problems and propose solutions (Rio Torca) • Create associations/organizations composed by different stakeholders to continue the restoration work in the long term. (Charles River, Mystic River, Rio das Velhas)
Nature-Based Solutions	For community use	Through volunteer programmes or community-based projects	• Removal of garbage and control of exotic species of flora and fauna (Cascais, Rios, Os nossos Rios, Charles River, Mystic River, Rio Torca, Rio das Velhas, Blue Loop) • Planting actions and promoting native flora and fauna (Blue Loop) • Water quality monitoring (H2Óctogono, Blue Loop) • Landscape management to increase accessibility (Blue Loop, Rio das Velhas) • Bird feeding and nesting boxes (Blue Loop)
	For organizations and entities	Professional associations, schools, public entities etc.	• Biofiltration ponds (MysticRiver and River Sokolówka) • Urban design measures (porous asphalt, retention ponds, creating wetlands and directing stormwater towards green areas) (Charles, Mystic) • Opening damns and restoring fluvial dynamics (Manzanares)

Table 2: Main features and issues detected in the cases and strategies to engage communities in these issues.

Terminology

The terminology used by the cases plays an important role in the understanding of contexts and results. Our interests were confined to keywords that evoked citizen science, community-based participation, and involvement of the community. The used terms reflect, in a way, the nature of the project's promotor and coordination mechanisms.

The term citizen science is only used in academic discourse - the Brazilian Streams for example, refers to it by involving trained volunteers who help to measure water quality. In projects run by professional associations/organisations, such as the Mystic River, Charles River, River Irk and Rio das Velhas, public participation is generally referred to as volunteering, and this brings together scientists and the local community. Other projects, like the EU funded organisation that coordinates the restoration of the River Sokolówka, refers to public participation by using the term stakeholder involvement. This is also the case of the River Kisumu in Kenya.

The amateur organisation Friends of the Blue Loop uses the words friends and volunteers when mentioning the people involved. For the projects that involve deeper structural changes to their rivers and include political decision makers, community involvement is generally referred to as public participation. This is the case of the Manzanares project and the Rio Torca project.

Project coordination

Considering who assumes the coordination of the project, shown in Table 3 and Figure 1, the survey reveals that the majority of the 15 cases was coordinated by professional organisations or associations. Out of the 8, only the Charles River, the Mystic River and the River Irk projects were fully dedicated to river restoration. The Sokolówka, Lilongwe, Kisumu and Rios projects were coordinated by associations/organisations which focus on broad purposes of environmental protection. The only project that is coordinated by a high school is the H2Óctogono Azul.

Three cases were coordinated by academic institutions, but only the Ribeiras do Brazil project also includes a scientific experiment. The Rio das Velhas and Rio Torca projects were coordinated by universities and besides restoring the respective rivers, also aim to create and disseminate knowledge. Three other cases were led by their respective city council. Finally, only one project was led by an informal group of citizens (Friends of the Blue Loop) who decided to come together and lead some river restoration actions on their local streams.

There seems to be no direct relationship between the project coordination (government, association, academic, etc.) and the results and restoration indicators; also, there seems not to be any pattern or trends related to the nature of the coordinator and the ways the local communities became involved.

Project coordinator	Project
City councils	Manzanares, Ribeiras de Cascais (Cascais City Council), Os Nossos Rios (V. N. Famalicão City Council)
Professional Associations/Organizations	Charles (Charles River Watershed Association), Mystic (Mystic River Watershed Association), Irk (Natural Course), Sokolówka (Switch Project), Lilongwe and Kisumu River (ICLEI. CBC), Rios Project (Portuguese Association of Environmental Education) and H2Octógono Azul (Highschool Alves Martins)
Academy	Rio Torca (University Antonio Nariño), Rio das Velhas (Federal University of Minas Gerais) and Brazilian Streams
Local Groups	Friends of the Blue Loop

Table 3: The list of the main promoters and coordinators of the projects

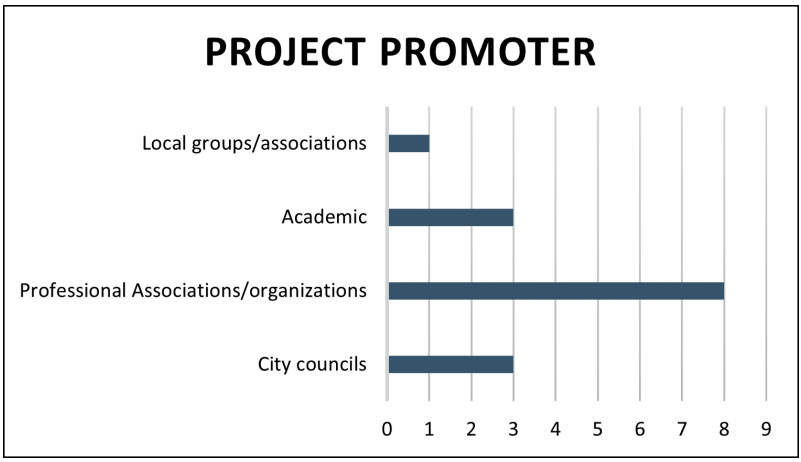

Figure 1: The four main groups of project promoters

Goal-setting

The next step encompasses the analysis of established goal(s) in each case. These specific goals depend on the objectives and opportunities of each situation; however, their analysis and comparison with those of other cases allow a better grasp of the strategic scope of each project as well as of trends regarding focus and approaches. This analysis addressed the stated goals of each project, the wealth and the achievement of such goals, depending on the availability of data. One challenge is that they are described with varying degrees of detail. Table 4 lists the goals of international cases and Table 5 those of the Portuguese cases.

Stated goals / Projects	Water quality, ecology, climate change resiliency						Community's quality of life						Community awareness and involvement		
	Implement eco-hydrological principles	Manage stormwater	Manage waterflow	Restore Habitats	Restore natural fluvial dynamics	Improve the relation between artificial features and river	Use existing materials and creativity	Develop a systemic and replicable approach	Improve parks and pathways	Foster community health	Improve relation between city/people and river	See urban informality and tinkering as an opportunity	Create awareness of river restoration importance	Use the community to identify problem and solutions	Enhance volunteers' work efficiency
Charles River		X	X	X	X					X	X				
Mystic River		X		X					X				X		
Brazilian Streams				X											X
Rio das Velhas										X	X		X		
Rio Torca		X		X							X				
River Lilongwe													X		
River Auji							X				X	X		X	
Rio Manzanares				X	X	X					X				
River Irk														X	
Blue Loop			X												
River Sokolówka	X	X	X	X				X			X				X

Table 4: The established goals of the international cases

Looking at the 15 cases and their goals, one can identify a great range of objectives, which cover most aspects of river restoration giving a fairly representative picture of river renaturing projects. The majority of the cases establish several intertwined goals - with ecosystem restoration (in a wider sense) at their core, since this was key for the research. Tackling ecosystem restoration lies at the heart of the Blue Loop, Charles, Manzanares, Rio Torca and Sokolówka projects; other cases like the Auji, Irk, Lilongwe, and Rio das Velhas have their main focus on enhancing active community engagement and increasing quality of life. Two cases, Brazilian streams and the Mystic River, divide their goals almost equally by the different approaches.

The goals that were mentioned the most are:

- restore habitat - 6 out of 11 cases
- Improve the relationship between city/people and the river - common to 5 cases

Further common goals, shared by 2 or 3 cases are:

- Manage stormwater
- Manage waterflow
- Create awareness of river restoration value
- Restore natural fluvial dynamics
- Use the community to identify problem and solutions

The goals that are specific to a single case are the majority, namely, 8 out of the 15 mentioned goals. These are:

- Develop a systemic and replicable approach – River Sokolówka
- Implement ecohydrological principles – River Sokolówka
- Improve the relation between the built environment (artificial features) and river – River Manzanares
- Use existing materials and local creativity – River Auji
- Improve parks and greenways – Mystic River
- Improve community's health – Rio das Velhas
- See urban informality and tinkering as an opportunity – River Auji
- Enhance volunteers' work skills – Brazilian streams

It is interesting to note that 3 out of the 4 goals set by the River Auji case are specific to it and are not mentioned by any other cases.

The Portuguese cases

Since the Portuguese cases were extremely specific about their goals, revealing numerous nuances to the same general aim, it is more interesting to divide them into 3 general goals, as presented in Table 5.

The analysis of the Portuguese cases reveals a strong tendency of the cases to focus on the development of education and public awareness-raising, with 3 out of 4 cases targeted to these issues. In the case of H2Óctogono Azul, the focus is towards improving the skills of students since this project was promoted by a school. The "Rios" project also put their efforts into raising awareness and disseminating

General Goals	Undertake Environmental Restoration	Enhance Quality of Life	Develop Awareness and Education
Rios	-	X	X
Os Nossos Rios	X	-	X
H2Octógono Azul	-	-	X
Ribeiras de Cascais	X	-	-

Table 5: The main goals of the Portuguese cases

information since it was promoted by the Portuguese Association of Environmental Education. The project "Os Nossos Rios", promoted by the city council, also focuses mostly on disseminating knowledge and raising awareness, but in this case, this is part of the main goal to act directly on the ecosystem restoration of the rivers. In the complete opposite end, the project "Ribeiras de Cascais", led by the Environment Protection Department of the Cascais Municipality, focuses completely on the ecosystem restoration of the rivers and streams. None of the goals mentioned for the four cases involved the relationship between the river and the community, or improving health, leisure or landscape issues.

Community engagement / Public participation

The analysed cases in river restoration projects with public participation revealed an interesting diversity when it comes to how the community is involved. In this context, it is important to remember that "community engagement", also referred to as citizen participation or public involvement, is understood here as any process that directly engages the public or local stakeholders in decision-making and/or opens up the projects to participants giving them opportunities to provide inputs and thus influence decisions and outcomes that might affect them. Table 6 presents a brief description of the goals and measures and how the community was involved in the analysed cases.

In the Charles River, Mystic River, River Irk and Torca River projects the local community participated through associations or organisations that coordinated each project. Individually, each volunteer signed up to be a part of the solution through different actions. The involvement of the community in the "Ribeiras de Cascais" and "Os Nossos Rios" projects was made possible through an individual application for volunteering - both projects were coordinated by the corresponding city council. The H2Octógono, run by a high school, was directed to the students, without involving the community. In other cases, like the rivers Manzanares, Sokolówka and Kisumu, public participation was engaged through organisations that, albeit not being the main promoter, would use the outcomes to inform decision-making. In the River Manzanares project, for example, the organisation "Ecologistas

en Accion" was charged by the Madrid City Council to enact public participation, as it represents 300 groups of ecologists and activists spread across Spain.

	Main guidelines		Applications (examples from the cases)
Structure	Integrating local communities during the project design phase		• Stakeholder meetings with the community (Auji River) • Through interactive digital platforms (River Irk) • Street community workshops on site to identify problems and solutions on a map (Rio Torca)
	Creating replicable and scalable concepts		• Independent groups with professional coordination (academic, organizations, etc.), with different stakeholders, including politicians (Manuelzão) • Programmes adopt a stretch of river and present a regeneration plan according to guidelines (Rios) • Long-term jobs and offices for the different river stretches instead of isolated projects (Charles, Mystic, Manuelzão)
Goals	Main aspects of river restoration	Community involvement	• Education and awareness • Project design participation • Field/volunteering programmes
		Ecological restoration	• Water monitoring • Habitat restoration • Ecological balance and improvement • Greenways and corridors for ecological connection
		Quality of life	• Programmes addressing - Climate change - Parks, corridors, and leisure facilities - Landscape values - Public Health
Community Involvement	Throughout the whole process	Project design	• Interactive digital platforms • Stakeholder meetings with community representants • Community workshops on site to identify and map problems and solutions
		Application	• Volunteering programs (Charles river, Mystic rivers, Brazilian streams, and ribeiras de Cascais) • Community is the main promoter (with professional coordination)
		Communication	• Thematic festivals/events (Rio Torca and Manuelzão) • Through "influencers" (Lilongwe river) • Thematic river expeditions by boat/kayak (Manuelzão) • Info centres for raising awareness (Rio Torca)
		Long term sustainability	• Info centres with mapping to update problems and suggesting solutions (Rio Torca) • Associations/organizations with different stakeholders to continue the restoration work in the long term (Charles river, Mystic river, and Manuelzão)
Nature-based Solutions	For the community	Volunteering programmes or community projects	• Removal of garbage, invasive plant and animal species (Ribeiras de Cascais, Rios, Os nossos Rios, Charles river, Mystic river, Rio Torca, Manuelzão, and Blue Loop) • Planting actions with endemic species and promoting native fauna (Blue Loop) • Water monitoring (Blue Loop) • Trimming vegetation to increase accessibility (Blue Loop) • Bird feeding and nesting boxes (Blue Loop)
	For organisations and government	Professional associations, schools, public entities etc.	• Biofiltration lakes or deposits (Mystic river and Sokolówka river) • Permeable pavements for biofiltration and retention, directing stormwater towards green areas and wetlands (Charles and Mystic river) • Opening damns and restoring fluvial dynamics (Manzanares river)

Table 6: Major goals, measures and community involvement forms in the analysed cases

On the issue of public participation, the case of Rio das Velhas is interesting. The leading coordination entity, the Federal University of Minas Gerais (a public university), divided the river into small sections, and created for each one a fairly

independent local community group. Making use of the knowledge that citizens are more interested in their immediate vicinity, these groups became the potential actors in measures to restore their river section. The Brazilian Streams project focused actively on hiring volunteers and measuring the efficiency of using their help was one of the key goals of this academic research. This project was the only one that specifically mentioned special training to the volunteers and measured the efficiency of using them.

Although public involvement in the river Lilongwe case was only achieved through awareness of river pollution issues, the case must be highlighted for its innovation and effectiveness. Having a nationally recognised star singing a song called "Rivers for Life", coupled with the intense broadcasting of the song, lent a helping hand in spreading the message and reaching a wider public. By using an "influencer", this project adopted a proven method of communication in order to obtain the best results possible for education and bringing the issues of water pollution to attention.

Another interesting way to raise awareness is the interactive digital map of the River Irk, where anyone could pinpoint existing problems and suggest possible solutions. This strategy enabled citizens to provide concrete inputs in terms of locations and actions that could be implemented along the river and its surrounding areas. This expanded the range of issues to be addressed, adding to the experts' view more local and lay views. Also, the proposed countermeasures could make a real difference in people's lives as they constitute answers to local shortcomings. The digital map also induces a higher commitment from both the local community and the council in the restoration process. This strategy enables a large number of people to participate in the decision-making process and to have real impact upon the projects' results and outcomes.

Further creative forms of reaching out to a substantial part of the riverside community can be the thematic public events and festivals, as well as the cases of "Rio das Velhas", the thematic carnival parade "Rio Torca" in Bogotá, and the kayak expeditions in the "Rio das Velhas". This kind of thematic activities, involving entertainment and culture, have a great potential for reaching a large portion of the community and consequently have a strong impact on how people see their local river and urban rivers in general.

Ecosystem restoration and nature-based solutions

Among the diverse methods used to increase the river's ecosystems and their connection to the cities, some cases revealed some interesting instances of creativity and efficiency in the use of nature-based solutions. Besides the more common measures of river restoration, like garbage removal, control of exotic species or water quality monitoring, we can highlight those cases which apply a wide range of measures and ideas in their river restoration proposals.

The Mystic and Charles Rivers have the more holistic approaches, as both also developed measures to reduce stormwater pollution to be implemented in the riverside areas to prevent the pollution of the rivers. Since the stormwater runoff is the major source of pollution and algal blooms, both the Mystic and the Charles river watershed association have managed to apply nature-based concepts to filter the runoff water before it reaches the rivers. The stormwater is directed into sidewalk flower beds or tanks/ponds to improve biofiltration. Apart from the importance of reducing the polluting nutrients reaching the river, such measures also help decrease the speed of the flow which makes the river water level rise. The same principle was used in the River Sokolówka, with biofiltration ponds created along the river course. These projects make use of nature's help to increase water quality and benefit from the ecological and social improvements arising from it.

Another case to mention is the Manzanares river project, although the level of community involvement is not as high as seen in other cases. The river Mansanares was channelised, and for nearly 60 years sluice gates controlled the waterflow on its passage through Madrid. This channel-like effect significantly affected the natural hydrodynamics of the river. The removal of the sluices restored natural hydrodynamics and sediment dynamics, thus creating more natural conditions. The natural formation of sand banks, water oxygenation and right breeding conditions enabled native plant and fish species to return to the area and to thrive, attracting more birds and even river otters that had not been seen in the area for over five decades. This is a good example of how a simple, inexpensive nature-based solution has brought biodiversity back into the heart of a large city like Spain's capital, improving water quality and landscape values. Even minor rehabilitation measures of degraded ecosystems can bring back some biodiversity and key services (Geist & Hawkins, 2016).

Nature-based solutions and public participation

In order to obtain an overview of the level of importance ascribed to nature-based solutions and public participation in each case, the percentage of nature-based solutions and the (potential) results were compared with the effectiveness of the different forms of public participation. Three key issues of public participation were considered:

1. Diagnosis and problem-solving processes
2. Active participation in measures and actions
3. Awareness-raising dimension

In this way, the balance and interactions between nature-based solutions and public participation could be better understood. The results are depicted in Figure 2.

Most projects (10 out of 15) can be located between the values of 1 and 3 when it comes to the importance of public participation to the project's outcomes; with only two projects achieving 4 and 5, and two others situated between 0 and1 on the

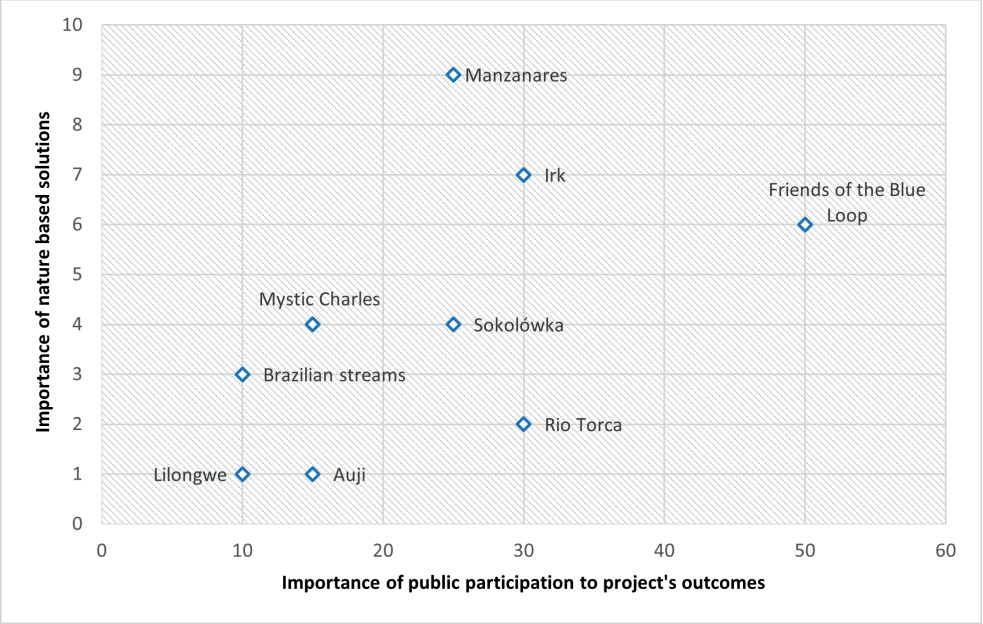

Figure 2: Level of public participation and nature-based solutions in river restoration projects

opposite end. Regarding the importance of nature-based solutions, there is a much more balanced distribution of the cases, with 2 or 3 cases in each level except for the top tier (between 4 and 5), where there is only one case.

Considering the total outcome, the case of the River Lilongwe, in Malawi, is one with the least involvement of public participation and nature-based solutions. This case is, therefore, far from the goal of engaging the community in creating nature-based solutions. This surely results from the fact that this project was launched to draw attention to the need to better protect the River Lilongwe. On the other hand, the Portuguese project "Rios" showed the highest level of importance allocated to public participation because the whole project was developed by the community, just like the project Friends of The Blue Loop. The difference between the two lies in the fact that the latter did not include awareness raising as part of its methods.

Focusing on the importance of nature-based solutions, the Manzanares river project scores the highest value. That is due to the far-reaching changes undergone by the fluvial hydrodynamics with more natural river landscapes, which were central goals in this project.

CONCLUSION - NEW PERSPECTIVES FOR URBAN RIVERS AS A RESEARCH STRAND

Analysing such a range of cases has enabled the BaseRiU Project to gain more knowledge and benefit from experiences. Buried underground or highly modified urban rivers are a common feature worldwide. Due to the loss of habitats, decrease

in water, environmental and landscape quality, cities around the world are opting to bring rivers back to life. For our research group (including the BaseRiU Project) it is relevant to identify best practices that can guide further research efforts. The cases cover a wide range of approaches, which enables a better vision of the different issues of river restoration that may need attention in the future.

The cases confirm the assertion that there is a strong interplay between the role of rivers in the process of urbanisation and the impact of urbanisation on rivers. Analysing the commonalities and differences between the various cases, their approaches and results provides us with a holistic understanding of both rivers as ecosystems and the role of restoration as a social process. Even though all cases have the aim of restoring rivers, each one has its own set of goals, approaches and measures, making the experiences on river regeneration a rich endeavour.

For a holistic river restoration process, as the cases show, there are 3 main pillars that should be taken heed of: ecosystem restoration, public participation, and education and awareness development. The cases confirm the major significance of involving the local community, besides showing that artificial habitats created for one purpose can be modified to enhance biodiversity and provide services that benefit the community. To achieve this, the community must be involved to be better informed and thus committed. In effect, it may sound like a cliché, but, as Geist & Hawkins (2016) assert, the first step in enabling recovery of any degraded ecosystem is to remove or reduce current impacts. The second, is that prevention is much better and mostly less expensive than cure. Thus, the call is to make greater efforts in conserving existing rivers and their ecosystems. In this way we can ensure a healthy environment. Developing strategies to better integrate the community in the river restoration process is one of the main focuses of this work. This was confirmed by all analysed projects in the most decisive manner – even with different levels of public participation. When it comes to the community's quality of life, the response should focus on improving the relationship between people and the river (through landscape improvements, parks, paths, leisure facilities, etc), health and safety.

The discussion on environment protection, biodiversity and climate change is leading to an increasingly sensitive urban society. These issues need to be resolved by environment-sensitive planning and its implementation along with effective management and monitoring. A river environment is itself a highly complex system with a variety of processes continuously changing along its course, and in urban areas rivers become more complex systems with more intensive human activities. Regarding the ecological restoration of urban rivers, the analysed cases show a variety of paths to achieve this: the focus should be multidimensional, encompassing recovering the natural hydrodynamics, managing stormwater flows and habitat restoration (removal of invasive species, garbage, etc.). This way, integrated, efficient and sustainable restoration can be achieved. Responding effectively to a sustainable solution will require (1) changes in our environmental behaviour, (2) a shift to more

ecologically sound urban design, techniques, taxes, and laws, (3) an increase in investments for ecological restoration projects, and (4) increased investments in research, knowledge transfer and education. The cases show that the results of tackling urban river issues as an ecosystem are largely independent of whether the whole river, parts of it, or entire river networks, in small-, medium-, long-term and large-scale projects, are considered. All projects have the ability to catalyse changes and push for policy changes. This calls for better understanding the projects' practices and the challenges faced.

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Rio Torca

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Manzanares Project

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https://www.esmadrid.com/sites/default/files/dossier_plan_naturalizacion_manzanares.pdf
https://restauracionfluvialriomanzanares.es/
https://use.metropolis.org/case-studies/the-madrid-rio-project
https://www.esmadrid.com/sites/default/files/dossier_plan_naturalizacion_manzanares.pdf

River Sokolówka

https://climate-adapt.eea.europa.eu/metadata/case-studies/urban-river-restoration-a-sustainable-strategy-for-storm-water-management-in-lodz-poland
www.switchurbanwater.eu

Os Nossos Rios

https://aspea.org/index.php/pt/projeto-rios-conhecer
https://enea.apambiente.pt/content/apresentacao
https://enea.apambiente.pt/sites/default/files/files/enea/projetos/Mem%C3%B3ria%20Descritiva%20Ficha%20ENEA.pdf

Cascais Streams

https://ambiente.cascais.pt/pt/projetos/ribeiras-cascais
https://enea.apambiente.pt/sites/default/files/files/enea/projetos/2-Projeto%20Oct%C3%B3gono%20Azul%20-%20Mem%C3%B3ria%20descritiva.pdf
https://poseur.portugal2020.pt

Towards city resilience, food security and territorial learning. Three territorial paradigmatic shifts triggered by the COVID-19 pandemic.

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Abstract - *According to projections, the urban share of the world population will grow to 66% by 2050, with people moving to cities seeking shelter and jobs. Whilst the current pandemic is questioning the validity of the globalisation upon which our societies rely, cities are growing even more dependent. Although the in-comers are hoping the city will provide them with what they need, they themselves could help to co-create a new urban reality in which people learn from each other to build more urban autonomy. This collaborative process will need to be facilitated through new approaches in urbanism that we suggest tackling here through the issue of city food security. Throughout time, historical ties to the localised food production system have been disrupted: globalised food systems have encouraged unsustainable industrial production processes that, besides generating pollution and reduced biodiversity, have damaged our health, created dependencies, and impacted upon food security. The objective of this chapter is to discuss the rationale for a new research project. Through a focus on Urban Agriculture in Lisbon, the project will analyse the potential for an urbanistic reform that could facilitate the creation of a sustainable food system based on sustainable agriculture, the circularity of activities, the empowerment of participants, equipped with 'soft skills', and the collective co-creation of sense-making of the city space. This chapter examines three urban issues concerning our approach to the metropolitan area of Lisbon as a contextual territory for urban agriculture. First, a shift away from a nature vs city dichotomy; then a reflexion on how cities could also become food production spaces, and, finally, a questioning of the global educational systems and a turn towards context-territory-based problems to be solved by local participants through new forms of Territorial Education.*

Keywords - Food security, circularity, urban agriculture, social urbanism, territorial education; resilient cities

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INTRODUCTION

While cities cover 3% of all land areas on the planet, they consume 75% of the world's energy, generate 80% of CO2 emissions, use large quantities of water and create an enormous amount of waste and pollution (UN, 2018). The objective of this research is to contribute to finding ways of making cities more sustainable. In particular, the aim is to increase cities' food security, citizens' sense of identity and belonging and to improve urban planning by integrating social urbanism values and social learning processes into it. The way in which we suggest doing so is to explore how Urban Agriculture (UA) projects could serve as platforms i) for the participatory creation of knowledge and skills in various target groups, ii) for the improvement of decision-making process and iii) to identify ways to assess the circularity of the food system processes and its contribution as a barometer in urban planning.

The research project described here adopts a multidisciplinary approach by working at the intersection of the two PhD programmes (one in education and one in urban planning). Finding ways of making cities more sustainable addresses the need to transform urban planning processes – in addition to improving the way they are built and managed. This is a social learning and participatory issue, which will transpire through social urbanism only if both planners and stakeholders are involved. For this to happen, new types of platforms need to be created. New advances in Territorial Education (TE) can help this; learning will be further enhanced if young stakeholders learn skills and feel better equipped for their future, and if older stakeholders are also invited to learn and share their know-how. The objectives of this project relate to those of the CeiED research areas, in particular those of the CEM and CIDATE[1], to the research programme in social urban planning, and also aligns with the FCT objectives to make scientific outputs accessible to citizens. In order to address the research questions raised by this book – i.e. to help us "increase the understanding, the challenges, the strategies of use and the management of the territory as well as processes and mechanisms of production of the urban space" - this chapter discusses three territorial paradigm shifts in three parts.

We first start by exploring how environmental and food security concerns, exacerbated by the pandemic, have questioned the territorial dichotomy between cities and the countryside. Then, a focus on circular economies, which link UA activities to other activities, will emphasise the importance in setting up the boundaries of the food systems at stake. Finally, we will explore at what territorial scale, and in which context, learning and governance are being facilitated to promote the development of sustainable cities.

[1] **Culture(s), Education and Memory(s)**, https://www.ceied.ulusofona.pt/en/directory-research/releco/cem/; **CIDATE: Citizen science in understanding and transforming the territory**, https://www.ceied.ulusofona.pt/en/directory-research/releco/cidate

QUESTIONING THE 'VILLE ET CAMPAGNE' DICHOTOMY

In terms of 'human habitat', the dichotomy 'city vs countryside', accentuated in old – and newer – folk stories, has been even more accentuated at the end of the 20th c. and at the beginning of the 21st c., with rapidly growing urbanisation. In Portugal, nearly a third of the population (2.8 million inhabitants) lives in Lisbon Metropolitan Area (LMA). A rapid urbanisation process there started with the country's entry into the EU (in 1986), its industrialisation, and turning its back on agriculture. 'Third Sector industries', such as tourism, rapidly developed. International businesses' headquarters relocated in Lisbon, cheaper than, say, London, and the capital city developed a unique capacity in integrating traditions with very forward-looking design, architecture or IT innovations. Such massive changes impacted the structure of Portuguese society.

Greening Lisbon

Other changes, such as the rise of environmental movements in the 1970s and the progressive impacts they had on urban planning, resulted in concerns about pollution, poor city dwellers' health, and negative psychological impacts on communities living further away from their natural environment. This led to the will to explore how to make cities more sustainable. The Rio 1992 conference, and then the 1996 UN City Summit in Istanbul, initiated this process in view of understanding how sustainability could be put into practice in the context of urban development. The nomination of Lisbon as the Green Capital of Europe in 2020 was the result of considerable efforts to recycle waste, reduce CO2 emissions and green the city. Lisbon was the first European capital city to sign the New Covenant of Mayors for Climate and Energy in 2016, after achieving a 42% reduction in CO2 emissions from 2002 to 2014, surpassing the 40% initial goal for 2030; and reducing energy consumption by 28% from 2012 to 2017 (Sustain Europe, 2020). Changes were made to the city's Masterplan (in 2012), resulting in a considerable increase in green corridors and areas, a strong emphasis on public transport, walking and cycling, and the development of a Climate Adaptation plan which includes a programme to plant 100,000 trees and the installation of green infrastructure to help reduce temperatures. The city expanded its green strategy to ensure an increase of 250 hectares of green space between 2008 and 2019, and a total of 350 hectares until 2022. Currently, 85.3% of the population lives within 300m of a large green area. All this brought some aspects of the countryside within the city, mixing the two types of environment. Whilst, for long, cities were perceived as the cultural core but also the (polluting) industrial centres, new 'environmental pockets' within cities, such as vast areas of forest (e.g. 1000 hectares in Monsanto) represent considerable 'lungs' to the country, despite being 'urban'. Figure 1 shows an example of a green wall – a wall on which vegetation is directly growing.

Figure 1. Full green wall in Campolide, central Lisbon. Source: All images by the author

Concerns about the health of city dwellers, originally related to the dramatic levels of pollution in their habitat, have been accentuated during the current pandemic, and research on the links between our weak immune systems and our ways of living was encouraged. "*Those living in polluted cities are more at risk from COVID-19*", the European Public Health Alliance already warned in March 2016.

For the FAO (2010), 'greening cities' goes beyond increasing the area of parks; it also means 'ensuring an urban type of development that can guarantee jobs, a clean environment and a governance that is beneficial for all citizens, but also food security. Regarding this last point, the current pandemic has shaken our economic systems by generating concerns about food chains. This is encouraging people to think about whether cities could and should possibly be more food-autonomous. Besides, people are also starting to recognise that industrial food production, and the hegemony of intensive farming and livestock have caused health, environmental, even ethical problems (Shiva, 1993). It might be time to bring nature into cities, in line with the concept of *continuum naturale*, introduced in Portugal by Caldeira Cabral in the 1950s, which led to the famous notion of 'green corridor' defended by Ribeiro Telles (1997), foundation of the Plano Verde de Lisboa and later integrated in the city PDM (2008). It is also time to adopt a systemic vision of the landscape within the process of the formation of the city (Sousa Matos & Sares Batista, 2013: 2).

Re-integrating agriculture within cities

Economic crises have shown to affect our relationships to the 'urban vs rural territories' by encouraging subsistence UA throughout times. The dramatic rise in the price of food products during the 2007-2008 crisis was, the FAO asserted (2010:5), the cause for a considerable increase (from 100 million to more than one billion) in the number of people chronically suffering from hunger. The most affected communities were poor urban ones. For the FAO (2010: 5), "*in order to green cities, one has to start by integrating numerous innovative solutions that emerged from poorer urban communities into urban planning reforms. One of these solutions focuses on urban and peri-urban agriculture*". In Lisbon, the FAO Information Office and the CPLP developed activities aimed at mobilising local authorities to formulate Appropriate Food and Nutrition Strategies, in 2017. This initiative complemented health strategies focused on food and diet (2010-2020) (Graça et al., 2020). In line with this, the Lisbon municipality established the Lisbon Strategy (2010-2024), whose objectives focus on city regeneration, climate change adaptation and connecting green spaces (Santos et al., 2015). Besides, Lisbon's Master development plan (2014) and the Green Plan (2008), together with the Biodiversity 2020 Strategy, promoted UA, stressing that it can enhance sustainable urbanisation, restore ecosystems, contribute to climate change mitigation and adaptation, and improve risk management .

The existence of 20 parks and 750 allotment gardens for local organic farming (Sustain Europe, 2020: 38) results from green initiatives and the evolution of UA tradition. If, as Cancela (2009) points out, such tradition already existed in the 21thc. in Portugal, with the 'quintas de recreio' that provided the city with fresh products, the resurgence of UA nevertheless tended to be symptomatic, later on, of immediate basic needs (for food) that could only be met by city dwellers' autonomous initiatives. Thus, in the 1970s, with the degradation of the economic situation in Portugal and the return of people from former Portuguese provinces in Africa, some shanty towns grew in the peripheries of cities, in parallel with spaces for subsistence agriculture. Marginal spaces (roadsides, ancient farms, or unoccupied urban areas) have been used for subsistence agriculture throughout time and today, several squatter gardens still exist in Lisbon (e.g. Horta do Monte, Vale de Carnide and Oeiras) (Santos, 2011; Saraiva, 2011). Delgado (2017) identified that, in Lisbon, UA has been focused for very long on food production for self-consumption among formal and informal frameworks and the 2008 economic crisis brought about a significant increase in allotment gardens. In 2011, Lisbon municipality began the programme 'parquet Horticolas Municipais' (CML, 2016), which today comprises 25 urban spaces, involving more than 500 families. Few years later, in 2013, according to the Portuguese national report to habitat III (Branco, 2016), 16 out of the 18 LMA districts had allotment gardens, "*covering 27 hectares of hortas urbanas*" (Delgado, 2017:140).

From the beginning of the 21st c. informal UA initiatives were backed up by more institutionalised ones and the question is now whether urban planners are actively going to facilitate further move towards city food-autonomy. In the same way that Paris has seen roof-tops being transformed into farms, the idea of making Lisbon less dependent on food imports makes sense. Figure 2 shows rooftops fields in central Lisbon and Figure 3 illustrates the fact that, in some neighbourhoods, fields are grown in the middle of urban areas (here in Santo Antonio da Caparica, South of Lisbon).

Figure 2: rooftops fields cultivated in central Lisbon

Numerous authors have highlighted the difficulty in shifting towards 'Sustainability food urban planning'. Cina (2015), who worked on the Italian peri-urban fringes, stressed that such an innovative shift was impeded by a strongly limiting obstacle: the powerful prevalence of buildable land values on agricultural land values and the consequent relegation of the PAA to the role of 'reserve for new urbanisation'. Others (PothukuchiandKaufman, 2000) highlight that, still in 2000, most city planning literature ignored food issues. Nevertheless, the rise of the urban food question in the Global North (Morgan, 2009) has boosted an extensive system of networks, associations, research centres and training institutes, and technical and regulatory instruments have been developed. The acknowledgement of the role of spatial planning in food planning, as well as the attempt to build new agro-cities, such as Almere Oosterworld, where the challenging objectives (to provide 50% of urban / agricultural areas) is associated with a bottom-up implementation model (Jansma

et al., 2013), has emerged (2009: 58). Despite difficulties, "*a new interest for re-integrating agriculture into urban areas has emerged in Western cities as part of food movements*" (Poli, 2017: 2). These were born in the United States and emerged from a food insecure system that had become dependent on agro-industry, with a high incidence of health problems related to poor nutritional value and the massive presence of additives in food (Feagan, 2007). Some communities even claim a role in the organisation of production and consumption chains in their territories, and appeal to acquire a certain 'food sovereignty'. In the US, certain territories have actually been redesigned according to "Community food security" in what has grown to be called "a process of re-spatialization of food systems" (Feagan 2007: 27). In many big Western cities, centres of agriculture have been created producing a phenomenon called by some authors "Agropolia" or "Agropolis" (Donadieu 2011; Mougeot 2005; Schröder 2011). In some cases, this has resulted in removing agriculture from the soil and push it onto buildings (roofs, skyscrapers, balconies, etc). In some others, the opposite has happened: for instance, 'guerrilla gardeners' reclaim urban soils to cultivate them. A striking case is that of Detroit, a city that went bankrupt because of the automobile crisis from 2008 to 2014, and which is now being transformed into a new hybrid city form with important UA initiatives (Dion, 2015; Ron Finley's TedX presentation).

Figure 3. Fields in urban areas – Santo Antonio da Caparica

In Portugal, concerns about food, diet, and health were addressed in 2012 through the National Programme for the Promotion of Healthy Eating, and later grew into the development of a national strategy throughout 2010–2020 (Graça et al., 2020).

Evidence needs to be drawn to illustrate new food systems issues arising from economic transformations post COVID-19. The current pandemic is creating an opportunity to re-explore how we produce food, who does it and how food relates to culture, history and identity.

With globalisation being questioned and, with it, the sustainability of food supply and food chains, the schematic vision of 'countryside producer of food' vs 'dependent cities, consumers of food' may be in the process of being reformed. A continuum of nature within the city is being created and cities are becoming hybrid territories. Beyond the 'ville et campagne' dichotomy, the current pandemic has introduced a new approach of the 'urban territory' that combines – rather than oppose – the physicality of the city to the digital networks that underpin its life, its co-creation (Smaniotto Costa et al., 2019), the planning of its activities and learning how to live together.

CIRCULAR ECONOMIES: ON WHICH TERRITORY SHALL WE 'CLOSE THE LOOP'?

Giving more attention to food systems within cities is going to open up a debate concerning how all types of activities and actors could connect through a 'circular economy'. This is because, as explained by Barbero and Tamborrini (2015: 517), "*the environmental sustainability related to food systems involves the entire food's life-cycle and every stakeholder who takes part in it. That includes food production, transformation, conservation, transport, direct sell to the consumer, consumption habits and disposal*". Thus, in this second part, we examine the territorial implication of developing a no-waste circular city.

Towards a city that feeds its dwellers. UA and Food security

The fact that Portugal focused on its industrialisation and considerably reduced its involvement in the agricultural sector when it joined the EU, led the country to suffer from an unbalanced food system within which it needs to import food to meet its own needs. With the current pandemic, concerns are expressed regarding food systems. According to the World Food programme, the Covid-19 pandemic could see more than a quarter of a billion people suffering from acute hunger worldwide by the end of the year unless swift action is taken to ensure that food supply chains keep running. The FAO (2002) defines food insecurity as a socioeconomic situation that leads to limited or uncertain access to the nutritious food necessary to maintain a healthy life. Various studies have focused on food security in Portugal (Alvares and Amaral, 2014; Maia et al., 2019; Gregorio et al., 2018). From 2014 until now, these estimated food insecurity in Portugal to be affecting on average 17% of the population. Learning how to strengthen food security and autonomy could be done through UA initiatives if those were better coordinated and integrated into urban planning.

The definitions of UA (Lourenco-Lindell, 1995; Moustier and Danso, 2006; Mougeot, 2006) all converge to describing UA as the growing of plants and the raising of animals within and around cities (Van Veenhuizen, 2006). It also includes concepts such as aquaponics, indoor agriculture, vertical or rooftops farming, edible walls and landscapes, school and community gardens, and other forms of integrated agriculture (Skar et al, 2020).

During the last 20 years, research has shown that UA can contribute to minimising the effects of climate change and to improving the quality of life in urban areas. McDougall et al. (2019) focused on the high yields generated by small-scale UA. Altierri and Nicholls (2018) investigated how agro-ecology, which can currently provide 15 to 20% of global food, could help cities reach a state of food self-sufficiency. Saavedra et al. (2017) investigated food system transformation through changes of diet. Howard et al. (2008) showed how Globally Important Agricultural Heritage Systems (GIAHS) could carry on feeding communities around the world. A has also been extended geographically through the CPUL concept - Continuous Productive Urban Landscape (Viljoen et al., 2005), which interconnects urban food producing landscapes within cities.

Various studies have been carried out on today's revival of UA in Portugal. Mougeot (2015) focused on hortas urbanas and studied how Portuguese innovative short food chains can be drivers for sustainable urban development. Saavedra et al. (2017) evaluated the agro-ecological potential of Lisbon to increase its Regional Food Self-Reliance (RFSR). Branco (2016) explored the historical evolution of the revival of UA in Portugal, and identified the beginning of the 21st c. as a turning point, when Portugal started benefiting from European programmes such as the Leader + initiative (2000-2006), which supported the PROVE (national short food chain enterprise oriented initiative connecting producers directly with consumers – PROVE, 2017). The first formal Portuguese allotment garden opened in 2003, led by LIPOR. In 2011 Lisbon started an ambitious programme (Parques Horticolas Municipais). The Portuguese National report to Habitat III (2013) listed allotment gardens initiatives (in 16 out of 28 districts) that constituted 27 hectares of hortas urbanas. The 2017 PRONE Programme (Portugal national short food chains enterprises oriented initiative) connected producers with consumers. The European programmes 'Cost Urban Allotments Gardens in European Cities' (2012-2016) and 'Cost UA Europe' (2012-2016) strengthened the connections between Portugal and Europe. Besides, Portugal, with 136 other countries, joined the Milan Urban Food Policy Act (OIKOS, 2017), an International Protocol that engages cities in the development of sustainable urban food systems (MUFPP, 2015). In the context of this Pact, Portugal won three awards through projects carried out in Funchal in 2019 and 2020, with a focus on social and economic equity. As stressed in the Pact, "*The Covid-19 emergency has shown that cities are at the front line to provide solutions to citizens' needs. In particular, food policy teams have to face many unexpected urgent challenges as the urban food systems have been severely hit*".

UA within the wider food systems and circular economies

The 29 UA initiatives mapped out by Delgado included allotment gardens (15/29), UA capacity building programmes (6/29), projects focused on commercial food distribution through short food chains (4/29), urban farms (3/29); and one gourmet shop. As Delgado (2017: 141) stressed, "So far, a key lesson is the absence of UA from a city food system approach that connects all stakeholders involved". Despite this, examples of 'connected' food systems exist – e.g. through the work of the cooperatives Fruta Feia (Fruta Feia CRL, 2017). ADREPES, or the PROVE programme, all good, applied examples of 'social economy and entrepreneurship'. Various schools of thoughts on circular economies have developed since the 1970s, referred to as 'cradle to cradle', 'industrial symbiosis', 'industrial ecology' (Beaulieu, 2015; Sauvé, Normandin and McDonald, 2016; Le Moigne, 2018). For the Ellen MacArthur Foundation (2019), the benefits of a circular approach are both social (it promotes 'green jobs' and eco-innovation), economic (improved productivity, efficient use of inputs and costs reduction) and environmental (reduction of raw material and energy consumption, of waste creation, of GHG emissions and improvement of soils' quality).

The issue of circularity is core to 'sustainable cities'. The linear urban metabolism (Rogers, 1997, Daigger, 2009) which dominates in contemporary towns is causing a plethora of problems (Skar et al. 2020). A circular approach leads to a redesign of the urban, peri-urban and rural spaces, and to a new conceptualisation of their interlinkages (Skar et al. 2020). The circularity of cities therefore calls for a reformed urban governance where stakeholders become better connected and interdependent. Our research project will therefore identify which activities UA could be linked to for it to contribute to 'closing the zero-waste economic loop' so that all by-products can be re-used in new innovative ways.

Our second paradigmatic shift triggered by concerns for food security in cities thus suggests that integrating circular production processes in urban planning within a metropolitan territorial geo-socio-economic system could help make cities more sustainable.

TOWARDS A TERRITORY-FOCUSED EDUCATIONAL APPROACH

Social urbanism

Creating a circular economy requires the construction of collective strategies, negotiation and much learning from each other. It implies that urban planners invite more participation and include food production - and the allocation of land for such purposes - as part of the urban planning process.

As Cancela (2009) highlighted, laws have been created that recognize agriculture as a compatible activity within the green infrastructure . However, as Chapter III of the UN-Habitat III report illustrates (Cavaco, 2016), too little focus, if any, has been put

on making cities 'circular'. Oktay (2012), Innes and Booher (2010) and Healey (2006) suggested working on 'sustainable urbanism' and to critically revisit collaborative planning. Participatory planning approaches have emerged, challenging the technocratic practices of the past through the promotion of more inclusive and democratic decision-making processes (Calderon, 2012; Healy, 1996). The work carried out on social urbanism and UA by Spada and Bigiotti (2017: 51) stressed that a "*new conception of the city could improve the use of UA to overcompensate for the empty spaces between industrial and rural areas, as well as sub-urban voids*". Work on governance processes, initiatives such as roof-top agriculture, and research on food justice, pursued the same objectives (Skar et al 2020; Toporova, 2018; Horst et al., 2017).

Measures of the benefits generated by such new models have vaguely been investigated. Deelstra and Girardet (2000) used the urban ecological footprint concept (Rees and Wackernagel, 1996) to measure the sum of land and water required to meet material consumption and waste discharge of a city's population. Developing 'barometers' of the circularity of economic activities could also help (Ellen MacArthur Foundation, 2018). Food production could be approached as an urban 'enterprise', engaging directly with the concept of Urban Metabolism (Girardet, 1999): circular food production would significantly reduce the ecological footprint of food consumed in cities (Jarosz, 2008).

As Oliveira and Morgado (2014:6) explain, "*A comprehensive analysis of how the current organisation of food production, processing, distribution and consumption in Metropolitan Areas requires a broader concept of a "food system" (…) at a scale that encompasses the whole production-loop*". So far, the rural-urban divide approach has persistently resulted in ill-conceived policy and planning tools (Tacoli, 2006). The fact that, in the LMA, 37% of the land is used for agricultural purpose, justifies the need to integrate its food system into urban planning strategies since, as Sonnino (2009)stresses, it relates to urban and territorial planning at all levels (food security, sustainability, social justice).

Our research project is thus exploring how social urbanism could tackle the long-term changes that COVID-19 will have triggered, focusing on participatory governance through UA. The current research context is favourable to it. In Europe, the New Urban Agenda stresses the 'transformative power' of urbanisation to operationalizing sustainability. In Portugal, the Directorate General for Territorial Development, in its 'Strategy for sustainable cities 2020', emphasised that "*UA is a growing social urban phenomenon, not only leading city's inhabitants to good environmental practices, but also helping the requalification of urban spaces with a positive contribution to social inclusion*".

The emergence of Territorial Education (TE)

The multiple and complex links between education and territory are generally better understood although "*the influence of territoriality on [changing] education has*

only really been tackled for fifteen years" (Champollion in Boix et al., 2015: 12). Yet, as Lahire (2012) emphasises, no other notion is at the same time as essential to the reasoning of human and social sciences and paradoxically as neglected as the notion of context.

In TE, teaching and learning are understood as dynamics that both can adapt to territorial specificities and can contribute to territorial sustainability by helping to re-establish respect for an adapted relationship with the local territory without losing a global perspective (Boix et al., 2015). Many institutional networks have recognised this and have been mobilised in many countries to facilitate the integration of a school in its territory, in line with programmes focused on Education for Sustainable Development (Francis et al, 2011).

Thus, for instance, Howard et al. (2019) presented the Living School concept, whose main message is that the learning outcomes of education for sustainability have to be meaningful in practice for communities, who therefore get a sense of ownership of the concept through acquiring the skills and the ethos that will lead to its operationalisation. These include critical thinking, communication, collaboration, creative problem solving, character education, and citizenship but also innovation, creativity, computer-enhanced learning, entrepreneurial mindsets (Fullan and Langworthy, 2013), but also outdoor learning (Williams and Brown, 2012), positive education, as well as social-emotional learning (CASEL, 2013) and health (Morrison and Peterson, 2013). These competencies, together with the principles of Community Economic Development , call for holistic approaches to creating sustainable communities. Work on living schools and CED helped re-localise and contextualise work on sustainability.

In the transdisciplinary agro-ecology educational projects presented by Francis et al. (2011), people felt that work on sustainable farming and food systems created an effective learning landscapes "*for students to deal with complexity and uncertainty and a wide range of biological and social dimensions, life-cycle analysis and consideration of long-term impacts*" (Francis et al, 2011: 226). In those projects, students develop new governance and management systems in order to improve the interconnections between agriculture and overarching resource systems of food, energy, water and land-use, using a whole set of skills - such as negotiating, open-mindedness, and appreciation of different perspectives. In Landscape Architecture, experiential learning and 'placed-based education' have also been advocated; Keeler (2011), for instance, documented the benefits derived from the 'Urban Farm educational Program' (University of Oregon) and concluded that "*place-based education implies a process of re-storying, whereby students are asked to becoming part of the community, rather than a passive observer of it*".

Overall, research has demonstrated that sustainability-oriented programmes could not be successful unless people directly concerned by them were also involved in their design and running (Healy et al. 2013). This implies an appropriate size of activities, at a manageable scale, but also a move away from a teacher-student model

and more active participation. As Kolb explained (1984), learners need experiential components to really understand concepts, as well as systems perspectives (Bawden, 1991) to apprehend issues such as sustainable cities.

In Lisbon, about a third of the UA projects (including the LIPOR programme, Lisbon Allotments Parks, and Cascais allotments) focus on mandatory training on organic production or composting, education and capacity building (Abreu, 2012). As Cancela (2009) showed, some UA initiatives created small-scale pedagogic kitchen-gardens in schools, or "Pedagogical allotments", where the public can visit and learn farming techniques, or even farm their own plot. "Olivais Pedagogical Farm" is one of the first examples, together with the "Alta de Lisboa" where, thanks to the organisation of local residents, an "urban agricultural park" was born in a truly bottom-up approach (Cancela, 2009: 7). Practically all the UA initiatives explored by Delgado (2017) include educational activities in parallel with food production. Learning is enhanced both conceptually and through experience and skills. TE based on UA could also include debates on health and immunity (Saavedra et al., 2017) – much needed during the pandemic - that could be one main motivation for learning about sustainability.

For citizens, institutions, small businesses and urban planners, working together at linking activities that could make the city greener – with UA at the core of a circular economy – could be a promising way to appreciate what 'operationalizing sustainability' through co-creating a sustainable city, might imply. Such process would "*focus on the collective influence and responsibility of all stakeholders in creating inclusive and responsive public spaces"* (Smaniotto et al., 2017: 53), and promoting integrated and lifelong learning education, backed by knowledge development, policies and democratic practices, which would assume the territory both as educational agent and content (Villar-Caballo, 2001). This could be done by building on the participatory platforms that have recently been put into place in the context of the city's Food Strategy, presented in the next section.

Integrating TE into participatory urbanism

Very recently, a research report came out (Serra, 2021) highlighting that Lisbon still needs a comprehensive strategy to integrate the Food System into urban planning and spatial management. The European project conducted semi-structured interviews with 31 types of stakeholders strategically identified to prioritise preferences for a food strategy (Serra, 2021: 6). These priorities were ranked and, out of 21, short food supply chain, food security, food waste, and food literacy scored the highest and helped to identify four main clusters (boosting agricultural production; stimulating sustainable food distribution; developing food education; and valuing waste). Through interviews and continuing participation, requests were identified to formulate a food strategy that would allow to improve elements belonging to these clusters. Thus, for instance, a global food strategy could help boost agricultural production by facilitating the provision of technical and financial support to farmers, or by

supporting organic farming and incentivising UA. About half of the people being interviewed selected a 'food platform' as a preferred governance platform for the development of a food strategy (Serra, 2021:21). The potential for making more land available for food production, as well as shortening the distance between producers and consumers, were perceived as real benefits from a Food Strategy, which could also provide funds for better governance, education and training (Serra, 2021: 24). Interestingly, this research facilitated online, interactive, participation and not only proved to be successful but also could be worked on to carry on integrating a comprehensive food strategy with urban agriculture and circular economies.

In the research project discussed here, pursuing work on the development of such a learning platform will be key to integrating very different urban citizens as active participants in the co-creation of urban space and the resilience of their city. Doing so "*will require a rich understanding of how people live, encounter others and move around, and of how people use public spaces, as well as what their needs and preferences are*" (Estrela and Smaniotto, 2019: 47). Therefore, the core 'facilitator' of social urbanism will have to be networks, which will facilitate SL outside educational institutions, with the exchange of different types of knowledge between alternative types of 'experts' (Castells, 1996), and through dialogical processes of joint-meaning construction (Johnson and Morris, 2010; Veugelers, 2011).

The radical divide that was drawn in the past between science and other types of knowledge (local, traditional, indigenous) has led to deep contradictions at the centre of contemporary epistemic debates. "*The challenge faced is that of converting [learning platforms] into cosmopolitan centres capable of building bridges between different cultures and types of knowledge in a process of epistemological decolonization*" (Teodoro, 2020: 94).

In cities, developing online platforms will help not only to consolidate networks and social learning but also in constructing 'mediated places'. In the same way pandemics changed the urban landscape throughout time, mass media also contributed to shaping public spaces. As Zammit et al. (2017) explain, in the 21th c. "*the introduction of newspapers activated public spaces in new ways and cafes became hubs for community building by providing a space for information exchange and dialogue. (…) As ICTs continue to change our social dynamics, they simultaneously modify the space that we use daily*" (2017: 138). With the current pandemic and need for social distancing, urban and public spaces need to be re-thought. This might lead to the emergence of 'third place spaces' that reflect 'distant proximities of socialites', which could well be mediated by ICTs (Graham, 2004, in Smaniotto Costa et al., 2019). Recently, the CyberParks research project (2014-2018) highlighted the need for a conceptual framework for the production of such 'digitally mediated public space' that it defined as "*space where nature, society, and cyber-technologies blend together to generate hybrid experiences, opening new possibilities of use and enhancing quality of urban life*" (2019:4). Since social interactions are important for defining a sense of place and for contributing

to people's physical, cultural and spiritual well-being, one challenge for TE is going to create open learning spaces, both physical and virtual, that enable people to be in a public space and to practise sociability on neutral ground.

The lesson drawn from this third paradigm shift is therefore that metropolitan areas could constitute relevant territories within which to contextualise education for sustainability if the new forms encouraged are to be genuinely inclusive and enable learners to also be the 'change agents' in city transformations.

CONCLUSION

The ways in which various aspects of globalisation have been questioned due to the current pandemic has also led to boosting reflection on how to make our cities more sustainable and food secure. This chapter has highlighted three paradigm shifts that are transforming our vision of the city (previously seen as the 'opposite' of the countryside, and certainly not a place for food production) and are suggesting that metropolitan areas could constitute relevant territories for 'education for sustainability'. Territorial Education has the potential to both help learners to grasp the multidisciplinary conceptual dimensions of 'sustainability' and to enhance experiential learning by focusing on practical skills and concrete collaboration amongst various stakeholders, on projects such as UA. It is characterised by broader learning experiences, amongst various types of stakeholders all engaged in the co-creation of their cities, through physical as well as online networks.

Whilst this research project has gathered evidence that Urban Agriculture can greatly contribute to the sustainability of a city, work now needs to focus on both deepening research on the evidence between the contribution of UA and the achievement of food security. Besides, most effort will focus on creating learning platforms that will most appropriately facilitate territorial learning.

To do so, building on the lessons drawn by educational projects such as that experimented on with university students in the Jakarta Metropolitan Area by Kinoshita et al. (2019) will be most useful. That educational programme focused on city sustainability, fostered five key competencies: systems-thinking, anticipatory, normative, strategic and interpersonal competencies. The learning experiment was based on a fictional narrative describing sustainability issues, in which the protagonist was the head of the local urban planning bureau. Materials were developed in the Case Method style (it reflected real-world issues and various perspectives on them), and students were required to address the problems that the protagonists face. The programme also focused on hypothetical scenarios regarding land-use patterns which addressed high uncertainty in urban future development and the respective impacts of various courses of action (Albert et al., 2015). Working on the scenario-based approach helped students to increase their anticipatory competence (Albert et al., 2015) and the production of cognitive-map was expected to bolster the

normative and strategic competencies by tackling conflict resolution and the building of trade-offs. Additionally, workshops improved interpersonal competencies by encouraging communication among participants from different backgrounds (Brundiers et al., 2020).

Because food systems and sustainable cities are complex issues involving a multitude of stakeholders with different perspectives, we also feel that Soft Systems Methodologies (SSM) (Checkland, 1999) could considerably help in collectively building a territorial learning platform involving both educational institutions, urban planners and other stakeholders. As Barboro and Tamborrini (2015: 521) explain, "*Systemic Design approaches open up the possibility of innovative and virtuous business models in which the waste that today is a burden tomorrow can become a resource for new industrial systems offering numerous development opportunities*". In line with the design of systemic approach, we feel that Adaptive Management (AM) will also be helpful in developing territorial learning approaches focused on UA, food security and city resilience. AM is a systems based approach to environmental and resource management in situations characterised by uncertainty and complexity. AM emphasises communication amongst stakeholders and generates an iterative learning cycle amongst them, which constitutes the basis of a management process that becomes adaptive. Bunch (2003), who combined AM and SSM, applied it to water resources management and described the various steps and techniques he used. Since the pandemic imposes social distancing, the creation of such collaborative workshops will have to be organised and carried out online.

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PARTE TRÊS
ENSAIOS

PART THREE
ESSAYS

The digits that follow the authors' name correspond to their ORCID iDs and should be viewed at https://orcid.org/[displayed digits].

The potential of citizen science for socio-spatial studies. Defining and operationalizing research pathways

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Abstract - *The term Citizen Science has been used in various contexts, but little effort has been made to provide a vision of it in regard to socio-spatial studies, which are at the core of the research group on* ***Citizen Science in understanding and transforming the territory (CIDATE)****. The authors of this chapter represent widely diverse disciplines, including environmental engineering, economics, urban planning and design, landscape architecture and education. The chapter intends to deliver a tailored and timely vision of how, with the help of Citizen Science, the democratisation of science can be promoted and, with this, more collective and sustainable decision making achieved. This chapter is the result of a reflective dialogue between researchers, their projects and experiences tackling spatial and human development from different perspectives. It gathers the conclusions that emerged in the organised debates and the research projects carried out by the researchers, towards creating a broad understanding of the key issues that could help operationalise Citizen Science in future research efforts.*

Keywords – Citizen science, socio-spatial research, key principles of citizen science, citizen's contribution to science, social sciences.

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INTRODUCTION

The term Citizen Science (CS) has been used in various contexts, but little effort has been made to provide a clear definition of it in regard to socio-spatial studies. As different perspectives may lead to different results, tailoring the concept and providing guidance is essential to obtain the best possible outcomes from future actions. In order to do so, the Working Group on Citizen Science of CIDATE has set a number of tasks, including:

- the search for relevant pieces of literature and their systematic review,
- note taking for a qualitative and integrative/interpretive forms of review of the various research projects already carried out at the CIDATE, and
- positioning on important issues related to CS along with the development of key recommendations on how CS could best be operationalised in the context of socio-spatial studies.

Citizen Science (CS) emerged as a field of research and practice in the 1990s, and refers to the active engagement of the general public in scientific research tasks. It arose from a variety of participatory approaches (action research, systems thinking and practice workshops, surveys and questionnaires, participatory GIS, etc.) that had already been developed, illustrating a strong need to not only democratise decision-making processes and involve people in projects but also to improve the quality of data gathered when making policies that lead to societal changes (Vohland et al., 2021). Originally conceived to facilitate good-quality large-scale data gathering, CS has the potential to transform the way we envisage scientific research and its impacts, namely that those who provide data as part of scientific research could also have a say concerning the scientific approach and the benefits research should bring. The collective creation of knowledge, through discussions between experts and practitioners, is questioning roles and giving a voice to those who, despite being generally viewed as the 'passive public', often know best. Traditionally used in natural sciences, CS is now extending its range of activities to social sciences and gaining popularity (Crain, Cooper & Dickinson, 2014). Research in all disciplines could benefit from it and contribute to its advancements – the question is how.

A socio-spatial study, as understood here, encompasses broad research with focuses on the production of the space (urban, rural, natural, regional or land-wide), the relational connections with the community who produces and consumes such space, and the technical, political and governing principles that rule the use of space (Taylor, 1998; Smaniotto, 2019). Such a location-based network is the methodological and theoretical key to urban planning, and subject to the experimentation, analysis and systematisation of research. It also encompasses the different categories in the efforts to "understand and organise" the spaces and society as well as the forces that govern both (Taylor, 1998). A socio-spatial study thus describes the amalgamation of different areas of knowledge that converge to the territory, through interdisciplinarity and transdisciplinary perspectives.

As Heigl et al. (2019:1) stressed, "*CS has amazing potential as an innovative approach to data gathering and experimental design, as well as an educational and outreach tool. Let's make sure that future CS projects have sufficient rigor to earn the respect of participants, scientists, and policymakers*". The beginning of networks of professionals in different countries, such as the USA, Australia, and in Europe with the European CS Association, and the funding agencies (e.g., the European Horizon 2020 "Science with and for Society" in 2017) promoting CS, have started to place the focus on the participants' side (the "citizens"). Therefore, it is essential to draw attention to such legal and ethical issues as intellectual property, privacy, scientific integrity and rigour. Neither definitions nor methods of CS have been harmonised yet. Societal needs, communities, scientific interests and approaches evolve rapidly. Working on socio-spatial studies particularly helps to highlight 'changing contexts' in places, people and place-making. It is from these perspectives that we are seeking a better understanding of an evolving form of pursuing research.

This chapter is a result of intense debates organised within the scope of the working group on understanding CS for socio-spatial studies, which constitute the core of the research group **Citizen Science in understanding and transforming the territory (CIDATE).** The authors represent widely diverse disciplines, including environmental engineering, economics, urban planning and design, landscape architecture, education and sociology, working together to create knowledge on the sustainable use of natural resources and, thus, inform decision-making. CS in spatial planning is a relatively new area of research. For this reason, it is relevant to reflect on how it differs from other participatory approaches, how innovative it is, and how research activities related to urban and territorial planning can make good use of CS and contribute by unfolding its dimensions and operationalisation.

In this chapter, we first gather the conclusions that emerged from our debates and the various research projects carried out at CIDATE. Next, the second part presents our positioning on key issues which, we believe, will help operationalise CS further in the future.

The investigation carried out by the group is based essentially on the review of the literature on Citizen Science, with the selection of some publications analysed individually in the debate sessions. These sessions allowed us to gather views from the different members of the group, who, due to their education and training, necessarily have different approaches to the subject.

In addition, the analysis considered CIDATE's past and ongoing research projects, which, as a source of experiences, allows a reflection on the importance of CS for a research project.

LESSONS LEARNT FROM OUR DEBATES AND OUR EXPERIENCES WITH CS

Conclusions from the debates of the CIDATE Working Group on CS

Whilst various definitions of Citizen Science coexist, the "**Ten principles of Citizen Science**" (see Table 1) (Robinson et al., 2018) seem to capture the main characteristics of CS from an operational perspective. They are aimed at stressing what matters most when using CS in a project.

1. **Citizen Science projects actively involve citizens in scientific endeavour that generates new knowledge or understanding. Citizens may act as contributors, collaborators, or as project leader and have a meaningful role in the project.**
2. **Citizen Science projects have a genuine science outcome.** For example, answering a research question or informing conservation action, management decisions or environmental policy.
3. **Both the professional scientists and the citizen scientists benefit from taking part.** Benefits may include the publication of research outputs, learning opportunities, personal enjoyment, social benefits, satisfaction through contributing to scientific evidence, e.g., to address local, national and international issues, and, through that, the potential to influence policy.
4. **Citizen scientists may, if they wish, participate in multiple stages of the scientific process.** This may include developing the research question, designing the method, gathering and analysing data, and communicating the results.
5. **Citizen scientists receive feedback from the project.** For example, how their data are being used and what the research, policy or societal outcomes are.
6. **Citizen Science is considered a research approach like any other, with limitations and biases that should be considered and controlled for.** However, unlike traditional research approaches, citizen science provides opportunity for greater public engagement and democratisation of science.
7. **Citizen Science project data and meta-data are made publicly available and where possible, results are published in an open access format.** Data sharing may occur during or after the project, unless there are security or privacy concerns that prevent this.
8. **Citizen scientists are acknowledged in project results and publications.**
9. **Citizen Science programmes are evaluated for their scientific output, data quality, participant experience, and wider societal or policy impact.**
10. **The leaders of Citizen Science projects take into consideration legal and ethical issues surrounding copyright, intellectual property, data sharing agreements, confidentiality, attribution, and the environmental impact of any activities.**

Table 1: The 10 principles of CS. Source: Robinson et al. (2018)

Although these principles constitute useful guidance, they are still, in our view, in need of careful discussion and potential revision. In particular:

Principle 1 states that citizens are actively involved. We would like to add that citizens do participate on a volunteer basis. If more and more citizens are to be involved in projects, with a view to democratising research and decision-making, the issue of what motivates these people to volunteer becomes crucial and worth thinking about carefully if CS is to be successful and if volunteers are to stay involved until the end of a project. Moreover, still regarding Principle 1, the use of the phrase 'may be involved' stirs controversy: we feel that the element of uncertainty it carries may also impact on who could end up being 'a contributor, a collaborator or even a project leader'. This lack of clarity in choosing who participates and why can lead to a situation that generates inequality amongst participants and may favour some views (from people with more confidence and/or more willingness to participate, or even more power) at the expense of others. In our view, the participation of citizens, even if on a volunteer basis, must represent the reality of the diversity of society. CS projects would therefore benefit from inviting people to participate more actively in a more methodical way. For our working group, CS considers citizens as projects' co-creators, actively involved in the whole process from conception, through to discussing appropriate activities to involve participants, strategies, and presenting the outputs of the project.

Principle 2, in our view, addresses the need and will to conciliate different perspectives. Reinforcement and valorisation of citizens' participation fosters parity between different opinions. Bringing citizens to project negotiations enhances knowledge. Citizens' participation broadens the knowledge of entire communities, and can influence the social contexts within which they live. Having several brainstorming and working meetings with citizens and their communities that value co-creation can contribute to establishing collective strategic guidelines. The projects based on CS can influence social policies.

In the formulation of **Principle 3,** we feel that the verb 'should' ought to precede "benefit": there *should* be reciprocity, otherwise there is no motivation for citizens to participate. The researcher whose role is to facilitate the communication between all the social actors involved "with" and "in" the process of building a project needs to be very clear about the role of all co-creators, and citizens need to know that they are invited in every stage of the research project.

As explained above, the phrase 'if they [so] wish' – used in **Principle 4** - could be controversial. It is important to be sure that co-creation is based on a horizontal structure that states and reinforces that everyone is needed, and their opinions count, in many ways. It should be noted that the citizens' participation in a scientific activity can take place in the background, in a relatively discrete or even "silent" manner.

Concerning **Principle 5**, potential problems in communicating scientific results / 'translating' scientific into 'citizens' language' constitute an additional difficulty in the case of CS. One of the aspects that are pointed out at the beginning of CS projects is that citizens are not only part of the whole work process as co-creators and critical thinkers, but also as social actors of the research process related to collecting data and being able to explain them and use them.

Principle 6 addresses the fact that there are various research approaches/methods used in CS. There could be more writing on this, maybe even in 'tool-kit' forms. CS also works with research action approaches that are closer to the knowledge of the subjectivities and the meanings attributed by different social agents to a given phenomenon. This context will increase the democratisation of science and, subsequently, citizens' scientific literacy.

With regards to **Principle 7**, the issue of 'privacy' is key, especially in CS projects applied to social sciences. CS projects' data and meta-data are very important. The instruments used to collect information must guarantee respondents' anonymity and make sure that their responses will be coded in compliance with applicable data protection legislation. Answers should be analysed by the group, instead of individually.

Concerning **Principle 8,** 'sensitive' projects (politically sensitive, for instance) may motivate citizens to remain anonymous. This type of situation may, and should, be considered carefully. In CS, participants should be able to choose to be acknowledged *or not*.

As for **Principle 9**, indeed the question must be discussed, and our view is that citizens do not *have to* be the leaders of the project. To be validated by academics as scientific, a project must be certified as an intellectual piece that respects strict procedures concerning how science is constructed. This implies that the project must be led by a scientist.

Principle 10 highlights the fact that participants should be sensitised to these ideas too: they must feel responsible for this, within the project – see also Principles 7 and 8.

Besides examining the 10 principles of CS, our working group organised **debates** around various readings, from which conclusions emerged as to how CS could be best used in the context of socio-spatial studies. Various approaches can be used, presenting different advantages but also potential shortcomings. When examining the outcomes of the research being carried out in Amsterdam by Groen & Meys (2017), it was clear that the favoured *modus operandi* was to focus on **public participation through GIS mobile applications**, which should not be confused with the simple collection of information from citizens using new technologies (e.g., smart phones). In that research project, these apps were used with the aim of identifying (urban) places of pride and places in need of attention in selected neighbourhoods. These apps are also frequently used in the elaboration of move-

ment traces that enable the tracking and mapping of collective pedestrian and/or bicycle flow dynamics through a specific urban area[1], using methods from Space Syntax or Geography. The relative success or failure of the implementation of mobile GIS apps, and collaborative data practices in general, seems to lie in the preparatory phase in which the initiative is presented to potential collaborating citizens. It may not be enough to present the initiative through traditional channels and promotion materials (flyers, posters, letters, web sites), but rather preparatory training sessions may be required to inform citizens about the objectives of the project and how they will be involved in the processes of collection, processing and dissemination of the data. Above all, it is important to ensure the transparency of the process and the engagement of participants, bearing in mind it can take time to raise the awareness of and involve citizens in the project. Holding exploratory meetings, workshops, or interviews in the initial phase of the work can be useful in this context, in the sense that citizens may feel more engaged with the policy making process or academic research associated with collaborative data collection. The bottom-up nature of many of these initiatives to gather information from citizens is questionable, especially when they have a political origin or motivation. It is not always clear to what extent the results obtained are incorporated into decision-making processes or into the final conclusions of an empirical research project. It is therefore essential to ensure evaluation mechanisms that allow citizens to verify how the data collected in the meantime has been incorporated in these processes and/or in the results of a participated study. These remarks point to the fact that participatory GIS, as one type of 'contributory CS', need to be carefully used for the scientific process to be genuinely participatory, and for the outcomes to benefit all. In urban contexts, it is fundamental to link the 'hard science' characteristics of Contributory CS (data collection) with the social, human, cultural, political contexts within which these data are going to be. The 'how to do so' and 'to which end' really determine the participatory and inclusive nature of CS.

When exploring the work of Crain, Cooper and Dickinson (2014), the **interdisciplinarity of CS** was discussed. Often, CS is used in natural sciences to ensure that more realistic, on-the-ground data can be collected by citizens and shared. When it comes to social sciences projects, the 'data' required is more related to perspectives, private data on social conditions and backgrounds, for instance – generally, data where 'privacy' really matters. Typically, the social sciences are subdivided between those that are fundamentally based on empirical observation, such as Ethnography or History, and those that are dedicated to the construction of models, such as Sociology, Social Anthropology and Economics (Lévi-Strauss, 1963:286). Today, these differences are more blurred, with most social sciences being founded on empirical data collection and analysis, often in interdisciplinary dialogue. In this way,

[1] Example: http://cargocollective.com/citizendatalab/Participatory-Mapping/GoGoGo

the methods used in CS may be of universal application to the social sciences, although it is recognized that they are most useful in ethnographic studies, in pictures of static activities (static snapshots), or in motion traces. In the specific case of urban studies (Al Sayed et. Al., 2014: 44-46). In addition, it is recognised that CS is not applicable to certain problems, namely those of an anthropological or economic nature in which scientific formulations of a theoretical nature prevail.

In our debate on the work of Silva, Aboim & Saraiva (2008), what also became apparent is that people living in cities and potentially exposed to associative movements were probably more likely to both understand the objectives of CS projects and be keen to participate in them. While mobilising citizens for political, civic or fundraising demonstrations seems to be easier in urban areas, as opposed to the countryside or small towns or villages, it might then be easier to carry out research activities in urban planning using CS in medium-sized cities with higher education institutions that could act as local partners. However, this raises the issue of the need to provide training to people in advance to carry out a CS project, i.e., to guarantee genuine inclusion. If participation is carried out only by those who are used to participating, a bias is introduced into the research from the beginning.

Urban agriculture (UA) is a good example of building links between rural and urban worlds, a subject discussed on the basis of the article by Pollard et al. (2017). The topic of UA in the Lisbon Metropolitan Area requires meticulous analysis using different perspectives, types of knowledge, and practices that bridge natural and social sciences. UA is sometimes confused with a playful or trendy middle-class activity, when in fact the "*hortas*" (vegetable gardens) are an ancient popular cultural feature of the people from Lisbon and its immediate surroundings. Such activities resulted in the common nickname "*Alfacinhas*" (lit. '*small lettuces'*) given to Lisboners, presumably because they used to grow them in their gardens. With the rural exodus that intensified in the 1950s and 1960s, UA acquired more complex contours, mixing several motivations: food self-sufficiency, reproduction of habits brought from the countryside, leisure activities. It also became a territorial planning problem through the systematic occupation of the public water domains and river margins, amplifying the risk of pollution, flooding and slope instability, often in association with urban areas of illegal origin (AUGI[2]). Beyond these problems, UA can, on the contrary, provide solutions through improved food security, diet, mental health, social cohesion, CO2 absorption, biodiversity, a more coherent food system and green infrastructure, to name a few. All these relate to the various dimensions of 'urban sustainability' – a concept which loses its meaning if city dwellers are not taking part in defining and operationalising it. The debate around Pollard et al. (2017) revealed that, although much action and participatory measures in agriculture research are carried out, very few of these projects see themselves as related to CS

[2] Áreas urbanas de génese ilegal - https://www.lisboa.pt/cidade/urbanismo/planeamento-urbano/areas-urbanas-de-genese-ilegal

per se. In the research project presented in the paper, focused on water usage in UA, the authors stressed the need to train participants, making them able to calculate and communicate data correctly, as well as make potential use of these data once collectively shared. In other contexts, especially in a European one, food security is a growing issue that affects urban planning, the distribution of various economic activities within this specified space, the need for an environmental balance between built and green areas, and the co-creation of urban public places. It relates to the food system of the city and therefore to the city as a human-natural ecosystem. The bottom line is that enhancing food security at city level cannot be done without the participation of its citizens through a 'social urbanism' process. What the UA example highlights is that CS is an ongoing learning process that enables perspectives and needs to be constantly newly defined and integrated into a global and more consensual urban strategy.

Experiences on CS from research activities

The mission of CIDATE includes the goal to expand knowledge on CS and how to make use of it in their strategic plans. Increasing knowledge of CS requires a better understanding of its architecture and learning effects. CIDATE is already involved in research projects that are yielding some experiences and lessons on CS.

Placemaking with teenagers was a case study from the **Project C3Places**[3] dedicated to advancing knowledge on the spatial practices of young people with the help of digital and mobile technologies. The case study in Lisbon focused on teenage students (aged 13-18), and on working out with them the design of a public space in the Alvalade neighbourhood. Teenagers were engaged in different urban living labs (Bylund et al., 2020), aimed at the co-creation of public spaces that meet teenagers' needs and preferences; and with this establish a teenager-sensitive public space.

1. he advancements of digital and mobile technologies open up new ways to increase research and engage with stakeholders, thus creating new participatory dynamics. In Lisbon, the project enriched the understanding of the relationships between spaces and social behaviour from a teenager lens.
2. Although Alvalade is a paradigmatic neighbourhood, planned according to a modernist Master Plan, with plenty of open spaces, the neighbourhood lacks an appropriate infrastructure to provide adequate opportunities for young people to socialise and interact outdoors.
3. The research programme encompassed different methods and tools, such as thematic workshops, exploratory site visits in the neighbourhood, discussion and debate sessions and surveys undertaken and analysed by the students. Living labs

[3] www.c3places.eu

were complemented with other methods and techniques of data collection, such as collaborative ethnography, space observations, and interviews with local experts. Such a wide range of tools provided a manifold and interesting interpretation of placemaking with teenagers.

4. By exposing the students to co-creation and participatory processes, C3Places opened a forum for discussing inclusiveness and sociability, making them aware that they can have a voice in the decision-making processes that affect their environment.

Urban Agriculture (UA) **in the Lisbon Metropolitan Area** - much research has been already conducted in Portugal on this subject (Oliveira and Morgado, 2016; Delgado, 2018; Dias & Marat-Mendes, 2020; Marat-Mendes et al., 2021), and what now needs to be done is to link the various initiatives into a broader, more holistic, food system strategy for the city as well as to ensure that the urban governance leading to this is participatory. Our project therefore concentrates on responding to this need by developing a participatory governance tool aimed at encouraging a network of UA initiatives to increase the food security of the city, and to help its citizens both to understand better what makes a city 'sustainable and resilient' and to take part in its transformation.

Various lessons have emerged from the ongoing work:

1. The current COVID-19 crisis together with efforts to develop social urbanism and 'sustainable cities' have led to some conclusions: i) research in UA can be useful for reasons related to health, nutrition, urban planning and social cohesion; ii) CS can help us gain an overall understanding of these issues through the perspectives of different stakeholders. Encouraging social and territorial learning, the co-creation of urban places and the expression of different perspectives can be improved through the use of CS.
2. CS goes well beyond 'Contributory CS' in this project: considering the 'reciprocity of CS', it must be included in the design of the CS methodology used in a project expected to build good participatory incentives and good retention. Similarly, issues of trust and data privacy need to be made very clear and addressed collectively from the beginning.
3. For the efficient use of CS, a project should not only lead to generating convincing data, but consider that small-scale, diversified types of UA initiatives can help consolidate food security. It also should lead to a data-collecting process and the collective construction of a better urban governance tool. To do so, using Soft Systems methods and Adaptive Management in conjunction with CS is suggested.
4. One of the major differences between participatory research approaches in agricultural projects and CS approaches is the use of digital tools – enhanced during confinement periods but also acting as an important constraint when various numerous stakeholders are involved. Building the appropriate interactive

participatory online platform will use a MURAL, a design thinking method aimed at facilitating collaboration and negotiations.

CyberParks Project[4], was a COST Action aimed at improving the knowledge about the challenging relationship between people, spaces and digital technology, and the production of more inclusive and cohesive urban spaces. The application WAY CyberParks (web and mobile app) was developed and tested as a digital tool that enables planners to monitor the way people use public spaces. It also acts as an interface for the exchange between users and planners, thus contributing to an increase in the understanding of users' spatial needs and preferences. Some workshops were carried out in public places, such as parks, gardens and squares, where the participants were asked not only about the places but also about the user-friendliness of the application.

The lessons learned from involving people in placemaking are related to:

1. Easing data collection, particularly of qualitative data, and improving the speed of their analysis.
2. The digital literacy of users and intuitive use of the app ultimately helped to shape the outcomes.
3. The experiences allowed us to conclude that the use of digital tools in engaging with people, besides providing meaningful data, also enabled people to gain knowledge about urban (planning) issues.

verDEsporto[5] explores, through an interdisciplinary and transversal approach, the appropriation of green spaces by sport and physical activities practitioners and the influence of the COVID-19 pandemic context in these dynamics. Supported by the principles of CS and co-research, verDEsporto aims at carrying out an integrative analysis of this social phenomenon, considering the participation of different strategic thinking of two different key agents (community and decision-makers). The main focus is to analyse the usage, needs, behaviours and values associated with the appropriation of and physical activities practices in greenspaces by different population groups. To reflect on the use, and appropriation, of the territory for the construction of more participatory, active and sustainable societies, different issues have to be taken into consideration, such as non-formal education, the sociocultural significance of physical activities outdoors, the quality of outdoor spaces. The methodology was co-developed by stakeholders and students (from Sports and Urban Planning) involved in the research.

Although the empirical part had just started (in November 2021) some lessons can already be drawn:

[4] www.cyberparks-project.eu

[5] https://www.ceied.ulusofona.pt/en/directory-research/projects/verdesporto-en/

1. The COVID-19 restrictions have forced people to interact with immediate surroundings in new ways – so people are more aware of a healthier environment.
2. The observation of physical activities in greenspaces and the analysis of the impact of lockdown on exercise levels requires mapping current conditions from the input of a broad public.
3. The working methods (participant observation, interviews and field diary) were widely discussed with relevant stakeholders in online meetings.
4. The usage of public greenspaces and the link between nature and wellbeing are starting points for cities to understand where investment in nature is most needed.

Outcomes from the 11th CeiED researchers' workshop

In July 2021, the annual research meeting of CeiED involving the three areas of its PhD programmes (education, urban planning and museology) focused on CS. Entitled *'From Citizen Scientist to Citizen Science: Crossed Perspectives in the Construction of Knowledge*', it encompassed, on top of plenary sessions, a visual art exhibition, a series of parallel sessions dedicated to PhD researchers, and a one-day Design Thinking workshop (hackathon).

Three core lessons and practical recommendations can be derived from the debates: 1) CS is an umbrella platform under which incipient issues and "old acquaintances" emerge and overlap, 2) The discussion stressed the importance of participatory approaches in all three areas (education, museology and urban planning), and 3) to face the challenges and opportunities that are not emerging, digital advancements can be useful for the production of knowledge. The latest is especially important as digital and mobile technologies are increasingly becoming ubiquitous, and their usage is becoming more than task- and work-related, as pointed out in Smaniotto et al. (2019). Digital and mobile technologies are opening up opportunities to facilitate participatory processes; this is associated with both positive and problematic aspects, such as lack of access to technologies and unequal perception of ICTs' potentials.

The Hackathon

The literature on CS actually highlights that there are various interpretations of CS (Eitzel et al, 2017) and, also, that there is not 'one right way' of carrying it out. Therefore, one of our objectives is to further explore how research can contribute to CS as well as how existing CS tools can be used. As Design Thinking is considered a promising tool (Brown, 2019), it was used to 'experiment with' in the hackathon. Design Thinking provides guidance on how to define a problem (by refining its definition and better understanding various stakeholders' perspectives on it), and how to identify a potential solution that responds to people's needs (Brown, 2019). The idea behind this methodology is to carry out a participatory process that engages stakeholders in problem solving and solution finding, and to identify which

specific aspects of the problem people should focus on and why. This process leads to the identification of the solution with a high impact and low effort. The 'Double diamond model' (Figure 1) is generally used to visualise the Design Thinking process, and to better grasp the idea of how we move between divergent and convergent thinking, i.e., first to understand the problem and then to find a solution.

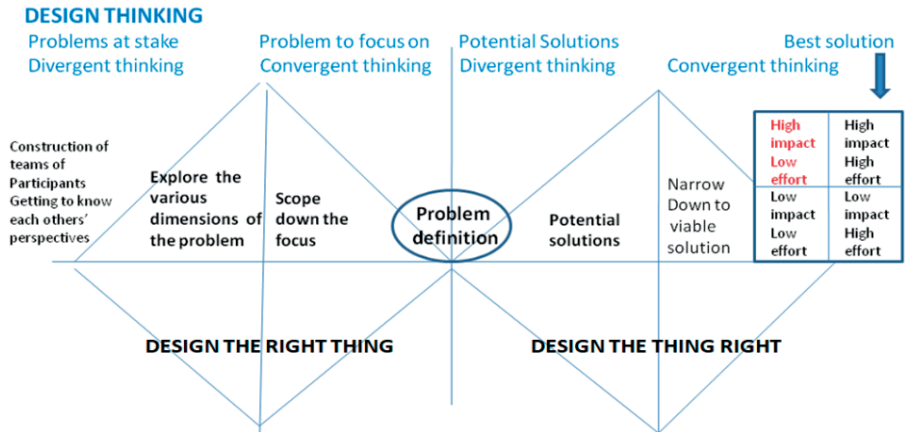

Figure 1: The use of Design Thinking to identify high impact – low effort solutions. Source: adapted from Brown (2019) and service design Academy (www.sda.ac.uk)

This approach was used in the hackathon, in groups of seven people on average. Each team was made up of students from different disciplines and levels, supported by a facilitator. Since it was an international online event via zoom, an online collaborative whiteboard ('mural') was used. Participants could communicate orally or write down their thoughts and suggestions directly onto the 'mural'. For each team, a distinct "mural" page was created. A scenario, summarised in Table 2, was prepared and suggested to participants to focus on.

The global pandemic forces us to rethink how we live together and how we share common spaces, like the university campus, for example. While we have developed strategies for teaching and learning with a variety of online tools, the college campus experience continues to be important to the academic community. It is equally important that we take advantage of all the potential that technological tools offer us. Within higher education, in-person and online approaches need to be carefully balanced so that the experience is enjoyable, productive, reflective and social. These precious years also need to encourage students to gain individual and professional confidence as they find their place within the young adult community and progressively build a professional network. While it is possible to learn at a distance, individually and even collectively, are we not missing out on some important dimensions arising from the experiences of "physically learning together"? What will be the new role of the university campus as a physical space in this new context of return to presence? We are invited to reflect on the various problems raised by going back to the university campus.

Table 2: Scenario selected for the hackathon

The role of the facilitator proved to be crucial since negotiation is the key to the whole process. People need to clearly express their statement(s) and idea(s), and to also be able to ask others for clarifications. Despite the fact that the mural is quite intuitive and easy to use, this modus operandi is not familiar to everyone and occasionally needed further explanation. Interestingly, creativity requires time - sometimes more than expected, since familiarity with digital tools varies, and for this reason it was expected that the more familiar would open up their imagination and contribute with 'as many ideas as possible'. Self-imposed limitations or constraints enforced by society or others often reduce the range of imagined or expected options and scenarios. Developing the 'divergent thinking' phase, whilst staying focused on the issues at stake, is an exercise. 'Converging' seems more in our habits, even though selecting both one specific problem and, later, one specific solution, still presents its own difficulties – notably that of remaining within the remit of the scenario originally presented. There is a high level of subjectivity not only in the reduction of all interconnected problems characteristic of the presented scenario and in the presentation of potential solutions but also in the selection of the high-impact/ low-effort solution. Further research could be carried out to better document these choices and, of course, a Citizen Science project would not, a priori, exclude this.

In this regard, the following issues were identified and underline the need:

- To re-examine the philosophy and methodology at the base of education, urban planning and museology. The awareness of these needs and the principle to return the results of studies and research to society call for improving education and transforming CS into a reflecting pedagogy, to reinforce the multidimensional nature of CS.
- To involve the community in processes of collecting, interpreting and reflecting on decisions and actions related to them, since the construction of the city, society and care for the environment are issues that concern every single person.
- To deconstruct adult-centred actions and to explore the agency of vulnerable groups, such as children, the elderly, native peoples, minorities, etc, for a more complex and richer socio-spatial development.
- To recognise collective practices as an efficient way to empower disadvantaged communities, e.g., in environmental activities. Such projects can develop social relevance (through the visual and thematic content they produce and through the collective bond they create) and deliver important working principles for CS.

KEY ISSUES AND RECOMMENDATIONS TO OPERATIONALISE CITIZEN SCIENCE IN SOCIO-SPATIAL STUDIES

Armed with the insights discussed above, and with the conclusions from the several debates of the Working Group on Citizen Science, we then selected some key issues

for on-going and forward-looking debates on CS. These key issues encompass the drivers and their components: STAKEHOLDERS, MOTIVATION, INTERDISCIPLINARITY, RECIPROCITY, LOCAL KNOWLEDGE and PLACEMAKING, AND USE OF DIGITAL TECHNOLOGY. These are the identified key issues that drive a process of active cooperation and open up new cooperation fields. In socio-spatial studies, they also help the development of new research methods and contribute to a discussion of experiences gained in practice. Figure 2 depicts these key issues and the main outcomes of their interaction. It is evident that, as far as the value-adding process is concerned, the previously stated arguments show that keeping the focus on isolated factors/approaches does not result in innovation and interdisciplinary knowledge. An interaction between these components can elucidate locally rooted needs while generating creative ideas and evidence that help the development of new research models.

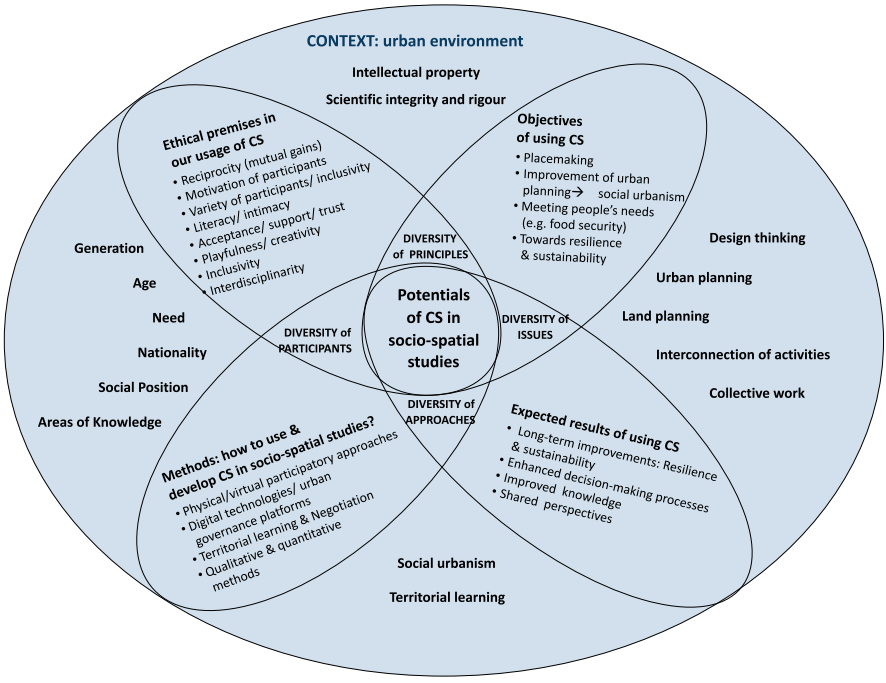

Figure 2: Key issues for on-going and forward-looking debates on CS in socio-spatial studies

On the power of interdisciplinarity: CS and the relationship between the social, human sciences and the natural, hard sciences

CS based on participatory methods of investigation has evolved through multiple manifestations in different areas of knowledge. Social and human sciences, focused on the dynamics that involve various processes of construction, production, and reproduction of social structures in contemporary societies, aim to improve a broad understanding of different spheres of social action. As such, the Social Sciences are

great contributors to knowledge on structuring the foundations, modalities, and scientific and social scope of the construction of projects related with CS, opening the methodological spectrum with new approaches associated with the active participation of the various stakeholders that share the social space. The contribution of the social sciences is strongly related to the enrichment of CS since it improves our knowledge of social structures and practices. The construction of social interventions in different areas - such as territory, urban design, education, sport, etc. - should be an action purpose informed by co-operation in different institutional and organisational frameworks. The association between social and hard sciences must be dialogical, in a context where each one complements the other, and where different values and practices come together to build knowledge through critical reflexivity. Participatory innovation (Hecker et al., 2018 in Tauginien et al., 2020) associated with an action research process that is closer to the knowledge of the subjectivities and the meanings attributed by different social agents to a given phenomenon, will allow the democratisation of science. The social sciences tend to make co-creation and co-reflexivity a socially efficient way to generate knowledge, a powerful testimony to the need for their inclusion in CS. The relation between the social, human sciences and the natural, hard sciences should not be by opposing different scientific ways of observing, studying, and presenting results about a certain phenomenon, as if they were irreconcilable. They must be seen as a consistent and powerful interdisciplinary way of contributing to Citizen Science, where each one can add and co-create valuable information and knowledge. This strategy enriches the processes, the actors, and the co-creation of scientific knowledge, once it amalgamates in an integrative way the effects, outcomes, impacts, and reality in question.

On the nature of research stakeholders

The ECSA first principle of CS establishes that "*citizens may act as contributors, collaborators, or as project leaders and have a meaningful role in the project*" (Robinson et al., 2018). Leadership by a citizen may occur, but only in exceptional cases - when she/he has unique experience in the research subject, or a compatible profile (e.g., an honorary doctorate or highly recognised prize). Nevertheless, a citizen that leads research in a non-university organisation might be able to coordinate scientific research, even if not affiliated with a higher education institution.

Hillier (2007: 194-195) uses two categories to divide knowledge: i) *scientific knowledge*, which is related with explicit abstract principles, and ii) *social knowledge*, which is a set of implicit rules that allow us to act socially in well-defined ways. The former is associated typically with universities and the latter with social organisations including private companies. Nevertheless, companies and other similar organisations – such as private foundations – can produce scientific and technological knowledge in a systematic way. In fact, the advancement of science and technology depends upon the efforts not only of universities, but also of research and development

departments or laboratories of companies, NGOs and other specific entities such as the military/armed forces. Classic examples of innovation in non-university institutions can be found in the Bell labs (USA) - where the programming languages C and S (later R) were developed, the US Air Force Rand project, which hosted the pioneering works of Richard Bellman in Dynamic Programming, or the Fraunhofer Foundation (Germany), where several innovative technologies have been developed, like the MP3 music compression algorithm. Another key example is fine chemistry, the advancements and innovation of which are essentially carried out by the pharmaceutical industry, sometimes in partnership with universities, and with the protection of patent systems, as suggested by the recent swift development of COVID-19 vaccines. In Portugal, there are two private foundations (Gulbenkian[6] & Champalimaud) with remarkable records in biomedical research, and both make use of Citizen Science practices.

The collaboration between universities and private companies is particularly relevant in the field of data science. On the one hand, tech companies need the high-level scientific knowledge in mathematics, statistics and economics that only academics can provide to implement machine and deep learning algorithms. The hires of Hal Varian (former professor of Economics at the University of California, Berkeley) as chief economist at Google, and Matt Taddy (former professor of Econometrics and Statistics at the University of Chicago) as vice president of Amazon are good examples of that trend. On the other hand, academics need the big data that private companies can easily provide and handle. As a matter of fact, the most innovative companies in data and technological areas are often spinoffs originating from universities. Companies like Alphabet (Google) or Facebook regularly publish scientific articles with their own methodologies and relevant scientific results[7], a phenomenon that is already observed in Portugal (e.g., Closer).

In summary, citizens can lead collaborative (data) science projects, if they belong to and eventually lead research teams in relevant organisations such as foundations, private labs or technological companies that work closely with universities, or with former professors and high-level academic researchers, maybe with the active involvement of citizens.

On the importance of reciprocity

The acknowledgement of citizens' participation when presenting the research outcomes is a characteristic of CS. Although sometimes it is impossible to quote every single participant when samples are particularly large, CS makes a point of valuing the work carried out by participants. In doing so, without fully conferring

[6] Science Gulbenkian promotes several initiatives (in partnerships) as the starting point for well-informed and participative citizens and change-makers towards a healthier, more sustainable and resilient future, (https://gulbenkian.pt/ciencia/science-society/citizen-science)

[7] Example of a paper published by Facebook's employees: Taylor S. J. & Letham, B. (2017). Forecasting at scale. PeerJ Preprints, 5. https://doi.org/10.7287/peerj.preprints.3190v2; https://facebook.github.io/prophet/

the status of 'researchers' *per se* to the participants, CS nevertheless recognises the importance of their contribution, knowledge, know-how and perspectives. If such recognition is important for some participants, others (citizens who, in the past, have been nearly systematically denied a voice, in particular) might interpret it in a different light. When it is the case, a high level of mistrust and scepticism might disincentive them from participating in a CS-based project. Their starting-point question will remain: 'What's in it for me?' If advocates of CS approaches have realised that citizens can contribute substantially to their work by enhancing the quality of the output and ensuring that their projects are more successful in the long-run, the opposite is not necessarily true. In order to participate in CS projects, in order to be trained - if necessary - and to remain active during the whole project, citizens need to feel that the whole enterprise is also useful for them. This level of 'usefulness in return', this 'reciprocity' (Hetland, 2020; Davis et al., 2017), is related not only to the level of trust within the research team, but also to the ability of the research facilitator to help with conflict resolution and negotiation. This is crucial to ensure that all participants can learn from each other's potentially differing perspectives, and appreciate the value of such exchanges and learning.

Reciprocity can also foster participants' willingness to expand the level of participation beyond the provision of data and, in turn, increase the impact either at the decision-making level or within the design of the research project itself. On this last point, many participatory projects in agronomy in less industrialised countries of the South, have worked with 'from-the-ground' knowledge because it proved more enlightened than other modern 'scientific' approaches - as they are better adapted to the local territory and its socio-ecological constraints. In such cases, farmers would completely change the way in which researchers had initially planned to carry out a project. Such rather exceptional events are becoming more frequent, especially in domains where a practical knowledge of the territory is required, and when the status of 'expert' is being questioned. Many areas of research in socio-spatial studies fit this category.

On the motivation to participate in CS

The best way to help CS projects to motivate people to participate is highlighting the practical results generated by these projects. Usually, the people who become participants are those who best know the history and experience of the places and communities they come from. If their participation is valuable to projects, they need to both understand that their participation is being valued and also be motivated by the fact that the project will ultimately be beneficial to them and their community.

CS has many potential benefits for science and its participants. To achieve this myriad of benefits, however, participants need to be recruited and, preferably, retained in projects. Recruiting and retaining participants can be costly and time-consuming (Merenlender et al., 2016; Wald, Longo and Dobell, 2016). Hence, it is not enough for citizens to participate, rather their participation must also

contribute to the main scientific goal of the project. Participants' life experiences can be diverse. This can enrich CS projects and make them more successful. CS organisers who are responsible for recruiting people should first identify carefully which person or group will participate, according to their skills and life experiences, background, age, gender, skills, so that the project's result is more inclusive. In terms of participation, younger people might be keener to participate with a view to acquiring knowledge, while older people's motivation to participate might lie in transferring knowledge. Another important dimension of participation lies in the fact that people from rural areas participate in a different way than people from urban areas, due to their less extended academic background and the very different social context within which they live and communicate with others.

Participation is influenced by CS project organisers' selection; therefore, selecting participants is an integral part of and crucial issue for the success of CS projects (West & Pateman, 2016). When participation is done voluntarily, the tendency is for participants to have greater involvement in the project because it usually involves factors of personal interests, contrary to organisational initiatives that primarily serve the interests of the organisation and consequently may attract fewer participants. If participation derives from people's own decision and motivation, the projects' results are more likely to be reliable and sustainable.

Several factors motivate people to continue participating in projects. One of them is people identifying with ongoing projects, while another factor is people having already been heard in the past and seen their contributions being considered or implemented. In some cases, participation is done for socioeconomic reasons, when people participate to receive some benefits such as food, monetary rewards, shelter, etc. It should be noted that this type of attitude can vary according to country, culture, religion, etc. One area that deserves special attention is how different types of motivation differ across demographic groups. This is important because some demographic groups (at least in Western countries) are under-represented in CS, with issues as gender, age, ethnicity, literacy, and socioeconomic status affecting the probability of participation (NASEM, 2018; Pateman et al., 2021)

To persuade participants to continue to participate in projects, CS organisers must create metrics to analyse the evolution of citizen participants' satisfaction on a regular basis. These studies can be done through social-psychological analyses, questionnaires, case studies, etc. When studies are being conducted, CS organisers must have a basic prior knowledge of the areas being studied. This can considerably reduce research time, and also allows the projects' organisers to identify in which ways and in relation to which specific issues the project might benefit the participants. According to Maslow's pyramid (Maslow, 1943; 1954), physiological needs must be met first: if people are facing difficulties, whether basic, security, or even self-esteem, their form of participation also varies. CS project organisers should pay attention to the motivation stage participants are at during and after being interviewed. This

will help frame specific methods of participation according to participants' motivation stage. Thus, for instance, participants looking for ways to meet their basic needs should be integrated in CS projects at different stages than participants seeking self-realisation.

Paying heed to the range of motivations of potential participants will increase the number of people taking part, as people will only begin and sustain participation in projects that meet their motivations (West & Pateman, 2016). Finding out participants' level of satisfaction enables the design of tailored recruitment and retention strategies.

On making use of participants' local knowledge

Some individuals and groups of people are more likely to participate in CS, and the degree of participation is associated with some factors, such as the level of education, professional and political areas as well as the urban dimension in which they operate (Silva et al., 2008). As a rule, associations have a more significant number of members the greater their geographic coverage, and political parties have more members in large urban agglomerations. In these cases, public participation, in the form of mobilisation and associative activities, tends to be greater due to more and enhanced information. This is because the people involved belong to organised groups, and the level of collective knowledge is necessarily superior to that of an individual acting alone. These groups of people seem to benefit from more formal participation. Professional work also seems to be linked to greater self-mobilisation for public participation, and the level of education is also a factor in involvement (Pateman et al., 2021).

Linked to participants and their motivations is their local knowledge, which is an intrinsic component of CS and placemaking. Local knowledge is defined by FAO (2006) as the knowledge and practises people have developed over time and continue to develop. It encompasses dynamic know-how and skills of people or their community, adapted to the local culture and environment. All this makes local knowledge inextricably linked to the involvement of local communities in CS projects. For sure, local knowledge is being challenged by technology advancements, so that there is a call for blending local-global knowledge and for crafting strategies to manage knowledge in a global context.

Citizen Science, placemaking and the use of new technologies

CS and placemaking are closely linked: both involve the incorporation of different stakeholders in their approaches to enriching the results. Besides promoting active engagement, both approaches also help increase diversity, improve legitimacy and expand local knowledge. Both are multi-disciplinary concerns. Whilst placemaking has its key focus on spatial planning (Strydom et al., 2018), CS can be used in different disciplines and studies (West, Dyke & Pateman, 2021; Pateman et al., 2021). Their amalgamation in planning issues enhances socio-spatial connections (Toomey

et al., 2020). An indelible relationship between CS and placemaking also means that the network grows as the linkages are strengthened. This implies that there is a strong connection between increasing participation opportunities, improving community resilience, responsive decision making and place-based learning. This last aspect relates to a deeper understanding of making places, i.e. creating quality urban environments that provide pathways for quality of life and sustainability considerations.

Keeping the focus on research, both CS and placemaking help create good science and deepen our understanding of social and spatial relationships. In this way, people's needs concerning spaces as well as their experiences and views, can take centre stage. This is particularly important in the case of groups considered vulnerable - such as children, teenagers, persons with disabilities, migrants, elderly, to name a few. Working with vulnerable groups opens for them the opportunity to raise their voices - that are otherwise overlooked (Smaniotto et al, 2020). Empowerment (of individuals and groups) is thus a main target of both CS and placemaking approaches. Cooperation, information sharing, and education enable new levels of personal and social awareness to be attained (Strydom et al., 2018). It must be pointed out that placemaking should not be focussed only on achieving an end-product, the process of empowering people itself is a relevant outcome. This is also true for CS, where the process of empowerment creates positive social change and enables individuals and groups to take action. This not only provides new perspectives and supports constructive debate but also makes sure that citizens' active participation in the making of the city becomes more inclusive and that, in turn, it will positively affect their quality of life.

Engaging and empowering indicate active support for achieving what Ringas & Christopoulou (2015) call transforming a city into a Sociable Smart City. An intensive and ubiquitous use of information (from local to global), through digital and mobile technology, is changing our perception of time and space. More and more digital and mobile technology and devices are creating sociability (interactions) through a virtual space, transforming our physical world into a hybrid form (Smaniotto et al., 2019). This hybrid space is being described and represented through digital technologies, and their applications have given birth to smart cities, where data and digital technology are used to improve efficiency in the use of resources and services and, ultimately, to improve the quality of life. As digital and mobile technologies continue to change our social dynamics, they simultaneously drive changes in the spaces we use daily (Zammit et al., 2019). The lure of the smart city is, however, fading away from the belief that technological fixes alone can solve our problems and respond to our social needs.

There is no doubt that digital and mobile technology, along with artificial intelligence, provide opportunities to elicit and understand urban-social dynamics and enhance the connections between them. The call is, however, to also develop, besides the IoT (Internet of Things), an Internet of Nature (IoN) - as pleaded by Galle et al.

(2019). According to the authors, heed has to be taken of the natural capital upon which cities rely, as there is the risk that it (the nature) will be left behind by the digital revolution. Even in the digital era, contact with nature and with the other is an essential part of well-being (Smaniotto et al., 2019). Such a dynamic process as digital advancements poses some questions such as how emerging technologies can improve urban ecosystems, and how to transform our environment into biophilic cities (Wilson, 1984; Biophilic Cities, n.d.). For this reason, smart citizens and in particular smart governance will be the cornerstone of a transition that will encourage creative participation and agency, and will put people and nature-based solutions at the forefront of transformations. The question is how to embrace the opportunities and challenges of leveraging digital advancements to engage and drive local communities into smart, equitable and sustainable urban transition. The central challenge remains how to make use of digital technologies to transform our cities into interactive landscapes, encouraging engagement and better social environments, supporting sustainability, responsibility and knowledge about nature, people and the city. At the end of the day, technology must make sense and must add value to the environment and people (Smaniotto et al., 2019).

Therefore, both placemaking and CS invite stakeholders to be both opportunistic and strategic in improving existing and in creating new urban environments. Both have the potential to test and try innovations in social and spatial senses. The outcomes are manifold, ranging from new forms of interactions, responsive places, and an increase in the sense of identity to attracting users and community ownership, and sharing responsibilities in the management of collective goods. In research, the outcomes emerging from CS and placemaking can be used as evidence to show that these approaches result in better informed public policies and agendas.

Key messages

Socio-spatial studies and CS approaches have their strengths and can effectively complement one another.

CS with community participation ensures the improvement of local data in socio-spatial studies, and better fundamental information for decision making.

CS opens the opportunity to involve different stakeholders and, in particular, to explore the agency of vulnerable groups, such as children, the elderly, native peoples, minorities, etc, for a more complex and richer socio-spatial development.

CS calls to establish dialogue and sensitive listening between all parts. This is associated with the call for crafting dialogue strategies and joint activities with different stakeholders, in order to foster and enhance mixed types of learning.

The outcomes emerging from CS need to be tailored as evidence to show that these approaches result in better informed public policies and agendas.

CS can help ensure that processes are participatory. This calls for establishing local coalitions backed by a global strategy.

CS, as a community collaborative-based approach, helps promote community development and territorial capacity.

CS, as any other approach, must ultimately make sense, and has to add value to the environment and communities.

CS engages citizens in data collection, resulting in a significant gain in knowledge for researchers.

CS allows the results of an investigation to be more reliable and locally rooted.

To be successful, CS must provide citizens with the necessary tools and knowledge from the beginning of the investigation.

Communication between all parties should be simple, objective and easy to understand.

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Escape from labs: How to expand the territory of brain research?

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Abstract - *Brain activity is most often tested in laboratories, while participants sit and sometimes even lie down. Still, although such advanced techniques of studying brain activity as functional magnetic resonance imaging, positron emission tomography, magnetoencephalography or electroencephalography (EEG), help us understand how the nervous system works and what exactly is going on in the brain during many activities, from simple ones, such as hand movements, to highly complex, e.g., arithmetic calculations, they do not allow us to measure brain activity under natural conditions. Thus, there are attempts to build mobile devices, e.g., mobile EEG. In this chapter we show that such a mobile EEG as MindWave expands the territory of brain research – allows for mobile observation of brain activity outside laboratories and therefore in (ordinary) everyday spaces. Moreover, we demonstrate that MindWave is one of the simplest and cheapest mobile EEG, and, at the same time, a very reliable tool, already successfully used in scientific research. In conclusion, we encourage researchers to escape from laboratories (from time to time) and study brain activity in "natural" (not laboratory/artificial) spaces.*

Keywords - Brain waves, electroencephalography, MindWave, mobile EEG, power spectrum

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INTRODUCTION

In recent years, very advanced techniques of studying brain activity, such as functional magnetic resonance imaging (functional MRI, fMRI), functional ultrasound imaging (fUS), positron emission tomography (PET), single-photon emission computed tomography (SPECT), magnetoencephalography (MEG), transcranial magnetic stimulation (TMS), as well as electroencephalography (EEG), have been created and developed (Eysenck & Keane, 2015). These techniques help us understand how the nervous system works and what exactly is going on in the brain during many activities, from simple ones, such as hand movements (Potok et al., 2019; Przybylski & Kroliczak, 2017), to highly complex, e.g., arithmetic calculations (Klichowski & Kroliczak, 2017; 2020). However, brain activity is most often tested in laboratories, while participants sit (e.g., TMS and EEG) and sometimes even lie down (e.g., PET or fMRI), and, consequently, under conditions unnatural for the activities tested (e.g., for behaviour in some territory). Therefore, there are attempts to build mobile devices to measure brain activity under more natural conditions (Reiser et al., 2019). So far, however, mobile observation of brain activity is possible mainly through EEG, so it concerns the measurement of brain waves (it is difficult to even imagine mobile fMRI, but prototypes of mobile cortical stimulators are being developed, similar to TMS). The so-called mobile EEG can be used outside laboratories and therefore brain research can be carried out in widely understood everyday (ordinary) spaces, and neuroscientists can study real behaviour in different territories (not in simulations) (Aspinall et al., 2015).

In this chapter we discuss the MindWave – one of the simplest, and cheapest, mobile EEG, which is both very reliable and already successfully used in scientific research. In short, the purpose of this chapter is to encourage the use of mobile EEG machines (such as MindWave) in research on human activity in different new spaces, as well as territories.

MINDWAVE MOBILE EEG

Mobile EEG devices belong to a group of most modern tools used for mobile monitoring of various parameters of the human body (Serhani et al., 2016). They are a type of a sensor used to monitor electrical activity (waves) of the human brain (Sun & Yeh, 2017). Mobile EEG machines are not only portable, but also easy to use (electrode amplifiers eliminate the need for a special gel, while the rigid structure eliminates the need for a cap – required for a stationary EEG equipment) (Huang et al., 2020; Sawangjai et al., 2019). Such tools are therefore used not only in scientific research (Bleichner & Debener, 2017), but also in everyday life, e.g., for studying at school or for checking the fatigue level of truck drivers (Huang et al., 2020; Xu & Zhong, 2018). It is also possible to combine them in groups and study the interaction between several or even a dozen people, e.g., players on the field or students in the classroom (Dikker et al., 2017). And although such tools are not

without some limitations (Huang et al., 2020; Ratti et al., 2017), they allow an ease, safe and, most important, basically everywhere to observe the work (waves) of the brain (Xu & Zhong, 2018). There are many mobile EEG equipment on the market (Huang et al., 2020; LaRocco et al., 2020; Minguillon et al., 2017; Sawangjai et al., 2019). It is worth mentioning such tools as:

– 72-Channel Dry EEG Headset (Cognionics),
– B-Alert X (Advanced Brain Monitoring),
– BR8 (Brain Rhythm Incorporation),
– ENOBIO 8 (Neuroelectrics), EPOC (Emotive),
– Muse (InteraXon),
– Nautiluswireless EEG acquisition system (g.tec),
– Quick-20 Dry EEG Headset (Cognionics).

However, the most popular is MindWave Mobile EEG (NeuroSky), developed since 2007 (Sawangjai et al., 2019; Xu & Zhong, 2018). The popularity is mainly due to the simplicity and low price (< 250 euro). As we show later, that is not all about prices. MindWave utilises a single electrode placed on the Fp1 position (see Figure 1) which is elementary for EEG research (Abo-Zahhad et al., 2016), i.e., the Brodmann area 10 (BA10). BA10 is part of the prefrontal cortex in the left hemisphere (Bludau et al., 2014). Of course, by receiving signals from Fp1, we do not just collect data from BA10, but basically from the whole brain. The reference electrode is, in turn, on the ear clip. The clip is attached in A1 position (see Figure 1), i.e., to the left ear lobe (Abo-Zahhad et al., 2016; Sawangjai et al., 2019). Figure 1 depicts the device design.

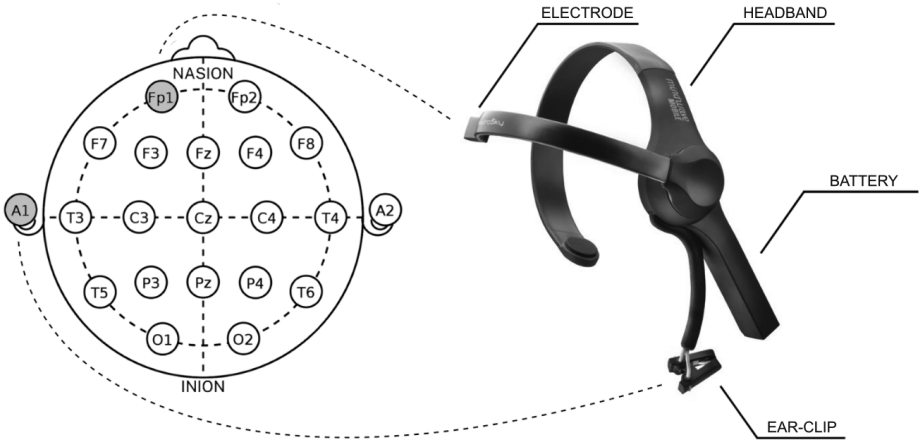

Fig. 1: MindWave Mobile EEG design. By using MindWave Mobile EEG, the single electrode is placed on the forehead, over the left eye, in the Fp1 position of the International 10-20 system for EEG (electroencephalography) recording. The reference electrode is on the clip fixed to the left ear (in the A1 position). The difference of the electric potentials recorded between these two electrodes is amplified, filtered, sampled, and finally analysed by appropriate algorithms. The device is powered with a battery, and the data registered is sent via Bluetooth to the researcher's computer or to a cloud such as Dropbox.

The signal recorded by MindWave is amplified 8000 times by this device, and then it is sent to a computer or cloud *via* a Bluetooth module. It is analysed only in a special application that can be installed on any computer (LaRocco et al., 2020). However, not only does MindWave measure the raw signal and power spectrum (alpha, beta, delta, gamma, theta). It also measures the attention level (mainly based on the beta wave: >14 Hz; this algorithm indicates the intensity of mental focus or focus on a cognitive task; the value ranges from 0 to 100) and meditation level (mainly based on the alpha wave: 8-14 Hz; that algorithm indicates, on the other hand, the level of mental calmness or relaxation; the value also ranges from 0 to 100) (Salabun, 2014). In both cases, the value from 0 to 20 means a significantly lowered level, from 20 to 40 – lowered, from 40 to 60 – neutral, from 60 to 80 – slightly increased, and from 80 to 100 – Increased (Przybyla & Klichowski, 2018; Salabun, 2014).

CORRELATION OF MINDWAVE MOBILE EEG RECORDS WITH BEHAVIOURAL DATA

MindWave Mobile EEG is a tool recognized as reliable (Hemington & Reynolds, 2014), and as demonstrated by Johnstone and collaborators (2012), measurements carried out with MindWave significantly correlate with those carried out by stationary EEG systems (complicated to use and very expensive), for example NuAmps (Compumedics Neuroscan). Of course, this also applies to many other (slightly more expensive and more difficult to use) mobile EEG devices (Hinrisch et al., 2020; Kam et al., 2019; Zerafa et al., 2018).

In addition, many studies (e.g., Chang et al., 2013; Enriquez-Geppert et al., 2017; Kosmyna & Maes, 2019; Nor et al., 2015; but cf. Hernandez et al., 2018) have shown that most of the data generated by mobile EEG is correlated with behavioural data, and therefore that they are not artefacts, but real characteristics of the participant. One of our most recent studies (Przybyla et al., 2021) shows that this also applies to the cheapest and simplest mobile EEG – MindWave. We carried out an experiment in which sixth-grade students participated. The aim was to measure the concentration parameter while performing tasks with MindWave. The training (control) task was to play a game in which the barrel displayed on the screen starts to burn when the concentration parameter increases. When the examined child reached a high level of concentration and held it for a while, the barrel exploded. The program recorded the time it took the participant to blow up the barrel. We treated this task as a control measurement, allowing us to obtain a parameter other than related to the experimental task, but showing in some sense the ability of the student to control their own concentration. In the final phase of the procedures, the students played a SpeedMath game, during which they had to perform simple mathematical calculations in memory and enter only the result on the keyboard. The programme analysed incorrect answers and the concentration parameter from MindWave. Then, we conducted a correlation analysis with other

variables collected in the course of performing tasks and through a short interview with students, as well as their teachers. These were: mathematics grade (expressed in numbers) and teacher's assessment of student's mathematical concentration and competences (on a scale of 1 to 5). Figure 2 shows that the concentration parameter measured with MindWave is correlated with maths's grades from the previous semester and in particular with concentration assessed by the teacher and teachers' assessment of mathematical competences. It reveals that EEG measurements reflect other parameters related to the cognitive functioning of the student or parameters analogous, but measured differently. Therefore, reliable analysis of the information provided by MindWave can be effectively used in predicting selected behavioural data, for example the assessment of maths skills.

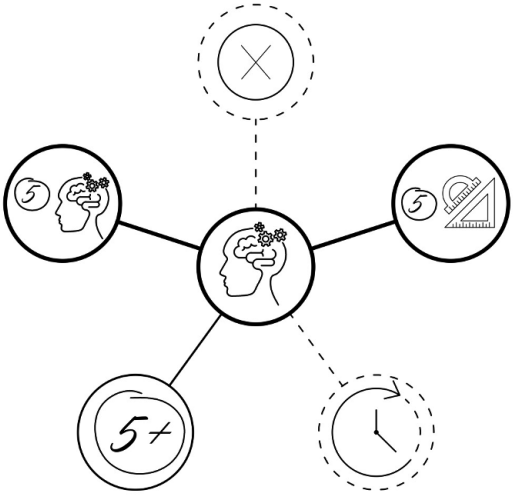

Fig. 2: Visualisation of the network of relationships between the concentration parameter from MindWave and other parameters related to the student's cognitive functioning

The concentration parameter is correlated with the concentration assessed by the teacher and teachers' assessment of mathematical competences, as well as with maths's grades from the previous semester. While it is not correlated with the number of mistakes made and the time of completing the control task. The thickness of the connections between the network nodes reflects the strength of their relationship.

AN EXAMPLE OF A MINDWAVE-STUDY IN NATURAL CONDITIONS

An example of a successful attempt to use MindWave Mobile EEG in natural conditions is our earlier study carried out as a part of the project on learning in CyberParks (Klichowski, 2017). It shows that such a simple and cheap device as MindWave can measure brain activity not only outside the laboratory, but also during movement.

The experiment was conducted in a park on our university campus. Sitting on a park-bench or walking along the paths the participants carried out several tasks on a smartphone, e.g., one-back task. This paradigm aimed at examining the effectiveness of processing information while memorising. The two-back task consists in showing several stimuli, one by one (words, numbers, pictures etc.). Every now and then, a picture is repeated. The participant's task is to react (for example, tap a button) when the picture currently displayed was also displayed exactly two pictures back (Klein et al., 2016; Konecky et al., 2017; McElree, 2001; Oberauer, 2001). Figure 3 shows the trial structure and timing in our two-back task.

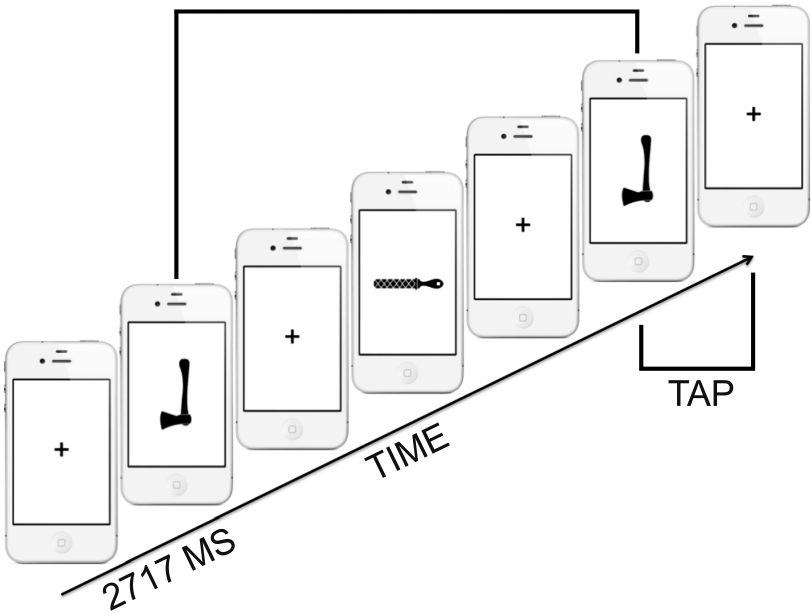

Fig. 3: The trial structure and timing in a two-back task of CyberParks-experiment. A point of fixation (+) was displayed on the smartphone screen for 2500 ms. Then, a picture of a tool was displayed for 217 ms. The participant had 2717 ms to tap. One block consisted of twenty-five pictures.

During the experiment, participants had the MindWave Mobile EEG fixed to their heads. Thus, we could observe what was going on in their brain (e.g., the level of attention and meditation) while performing tasks, millisecond by millisecond. Figure 4 visualises the dynamics of attention and meditation while carrying out two-back tasks, i.e., how their levels change in time. As we can see, the dynamics of attention is different when a two-back task is performed in a sitting position, compared to performing it while walking. This refers to slightly longer periods of lack of concentration during walking and to the fact that the dynamics of attention reflects the dynamics of the cognitive task during walking worse than during sitting. The case is similar as far as the dynamics of meditation goes: The profile for sitting is different from that of walking, and these differences refer to slightly longer and

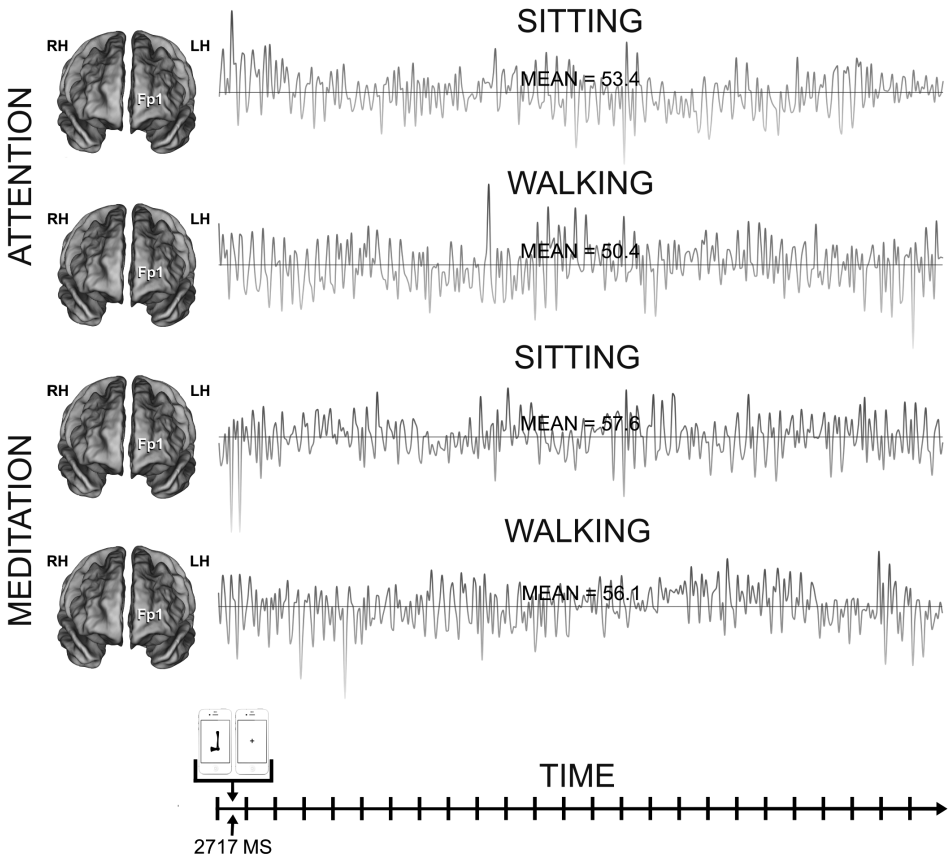

Fig. 4: The dynamics of attention and meditation during two-back tasks measured with MindWave Mobile EEG. We observed slightly longer periods of lack of concentration and slightly longer and stronger periods of stress during walking, as compared to sitting. LH – left hemisphere, RH – right hemisphere.

stronger periods of stress during walking. This allows us to conclude that when learning in CyberParks (e.g., using a smartphone), one should sit, not walk. We would not be able to make such observations in a laboratory and, consequently, educational activities with the use of smartphones during walks in parks would still be encouraged (for a full review of these issues, see Klichowski, 2017, and Klichowski & Patricio, 2017).

CONCLUSIONS

Although we have excellent laboratories to study the activity of the human brain, we increasingly see the need to escape from them. Why? Because sometimes it is impossible to simulate natural conditions in a lab. Then mobile tools measuring brain activity become helpful. For now, they can mainly measure the brainwave (mobile EEG), but perhaps soon, we will have more mobile neurotools. In this chapter we

have shown that mobile EEG devices such as MindWave are not only cheap and easy to use, but also very reliable and already used in science with success. Thus, we encourage (from time to time of course) to escape from our labs and expand the territory of neuroscience to outdoor spaces. This is the only way to really understand the territory we are exploring.

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Social responsibility and underground heritage valorisation in small rural communities: Lessons from two Italian cases

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Abstract - *There is increasing interest in gaining a better understanding of how small communities have (or have not) been involved in placemaking, and how to secure a more sustainable approach to underground heritage. This contribution analyses two cases of underground heritage in the Province of Ancona, Marche Region, Italy. These cases are located in the Apennine area in two neighbouring municipalities, Genga and Sassoferrato. The first case concerns the Frasassi Natural Caves (Municipality of Genga), which are an amazing natural underground site. The Cabernardi Archeo-Mining Park (Municipality of Sassoferrato) is the second case, which represents one of the most interesting mining areas in central Italy. The study aims at investigating how placemaking and co-creation should engage communities and tourism stakeholders in developing a sustainable rural tourism approach. The two cases represent different approaches to rural tourism development, both however aiming at creating added value for their amazing underground heritage sites.*

Keywords - Underground heritage valorisation, rural tourism, social responsibility, sustainable development, natural resources, co-creation, placemaking

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INTRODUCTION

Why does Europe (including Italy, for its immense natural and cultural heritage) struggle so much to become the first world tourism destination? One of main reasons is that tourism, being a leading industry, needs to maximise the number of visitors and at the same time be able to keep high levels of both appreciation and return rates. However, by now it ought to have become clear that tourism needs to avoid, or at least reduce, its environmental impact, both in urban and rural contexts. Successful tourism destinations should be able to invest in skills rather than infrastructures. Responsible approaches to tourism are more than just business, they are quite innovative cultural approaches leading people towards more responsible behaviours and improved experiences for visitors. In other words, responsible tourism is broader than any other form of tourism: it's rather a novel approach for tourists and local stakeholders.

Both the European Union and the Italian government suggest setting ambitious but achievable goals to improve destinations when it comes to implementing more responsible and accessible tourism actions. In particular, what makes a local development plan successful is the local stakeholders' ability to address feasible actions and goals targeted at cultural and social identity and integration. In this regard, the overall concept of Community-Led Local Development/CLLD (EU, 2015) is based on the assumption that public administration, farmers and entrepreneurs, tourist operators and destination managers, working together, are able to strengthen the (material and immaterial) heritage, develop potential projects according to a responsible local governance scheme, and create successful experiences that boost the local economy on a large scale. Taking into consideration the multifaceted contexts of environmental, agricultural, cultural, economic and social goals is a requirement that allows all of them to be improved, resulting in an upgrade of skills and quality of life for local communities. The LEADER Programme[1], which came into force more than thirty years ago, thanks to the CLLD approach, has now become a key element in fostering local development in rural areas with a more participative approach. The backbone of LEADER has undergone several changes, the current revision being centred on improving the community's strategic strengths. Such change has led it towards new visions of the mechanism that channels European Funds for Agriculture and Rural Development to territories, local administrations and entrepreneurs. Such a vision has had several positive impacts, such as more sustainable local planning, broadening of agriculture businesses, a long-term perspective, and better local governance and policing, to name but a few. In particular, the attention here focuses on bottom-up, multi-objective partnerships and multi-fund approach – objectives pursued by the European Union through the European Agricultural Fund for Rural Development.

[1] https://enrd.ec.europa.eu/leader-clld_en

The OECD (2009) pointed out that improved relationships between urban and rural areas could lead to higher growth rates for both, as they connect similar, albeit complementary, potentials in different places. On such a matter, which has also been included in the Memorandum of the European Rural Agenda (EU, 2015), several stakeholders and advisory groups have challenged the European Commission over an array of key issues, stressing the fact that rural territories have a great growth potential which can be better explored by more balanced relationships with urban areas. Looking at the issue from this angle, public investments could be channelled to local authorities, private endeavours, thus giving life to innovative local platforms of private-public partnerships working together towards tourism development.

The present essay aims at exploring two cases of underground heritage in the Italian Marche Region and their co-creative approach: the Frasassi Caves, managed since 1972 by a public consortium, and the Cabernardi Archeo Mine Park, managed by the municipality together with a non-profit association and, recently, by a local cooperative managed by young people.

THE RURAL TOURISM INDUSTRY

Rural tourism is a rapidly growing economy for inland areas, and has become one of the main income generators for many countries in Europe, including Italy, even considering the poor past years' performance, with COVID-19 restrictions in place (Esposito De Vita et al., 2020; Orîndaru, 2021). Since rural destinations have ensured strict physical distancing measures and many Italians have chosen to spend holidays in less crowded places, in 2020 and 2021, Marche rural outdoor and heritage sites hosted an even greater number of Italian tourists. Rural tourism in Marche is experiencing steady growth; the number of nights spent in rural areas has increased by 5.3% between 2012 and 2018 (EC, n.d.). Farmhouses are key players, and in Europe there are 10.5 million farms (Eurostat, 2019). The difficulties in generating sufficient income have driven farmers, in many cases, to divert from the agricultural base to different forms of income diversification (Fiume Fagioli et al., 2014). Diversification from the primary agriculture activities has become a necessity, and secondary agricultural activities and services, mainly related to rural tourism development, have represented the major source of income in the past decade. The Marche Region is investing in one of the greatest organic farming districts in Europe: 2,202 farmers, 78,650 ha under organic farming, with an increase of 18,625 ha in the next few years (Regione Marche, 2021; Romano, 2021). These figures highlight how vital the food and wine production sector is, showing the close attention paid by local farmers to the reduction of the environmental impact. Agritourism is becoming the main national (and regional) activity in a multifunctional agriculture, boosting rural hospitality, even though, due to the prices, hotels still remain the favourite form of tourist accommodation.

The sustainability of this income source depends heavily on ensuring that its social, environmental and economic impact is both positive and inclusive. This goal involves

the participation of all tourism stakeholders (Fiume Fagioli et al., 2015), and more deeply the engagement of social responsibility. In this context, it is critical to consider the relationship of self-to-self (Carson & Pennings, 2017), as many tourists seek greater insights into self-knowledge by way of virtual, social media or physical activities, through closer contact with the environment (Garau, 2015).

An important role in tourism development in rural areas is played by the Regional Cohesion Policy, since EU development policies, including the Cohesion Policy, need a place-based approach (Faludi and Peyrony, 2012). This makes territorial cohesion an important element in a co-creative process towards a more sustainable tourism economy. After all, territory is the stage where residents, businesses and public authorities interact. It is a dynamic platform for co-ordinating joint public and private actions with rural-coastal tourism linkages, and to bring together different approaches and goals, even if they are sometimes controversial. This requires incisively fostering a social approach to the economic tourism development of internal and rural areas competing with coastal tourism.

The local pilot area of the *Appennino basso pesarese e anconetano* of the National Inland Areas Strategy (SNAI), according to the Cohesion Policy Strategy, is engaged in supporting 9 Municipalities, including the Municipality of Sassoferrato, in developing projects through co-creative processes to promote the local Inland Strategy. SNAI could have been an excellent opportunity to strengthen the CLLD approach also through multi funds (ERDF, EAFRD, ESF, National Funds, etc.), but this did not happen.

Since 2020, SNAI created the *Alte Marche* pilot area, in order to brand it for tourism, develop and promote local tourism, to be supported by a Destination Management Organization (DMO). The DMO will include other important destinations in the region, such as Urbino (UNESCO Historical Site), Fabriano (UNESCO Creative Cities Network) – with the Frasassi Caves planned for future addition. The Alte Marche tourism brand includes five clusters: Outdoor assets, Culture, Spirituality, Food and Wine, and Creativity.

Rural tourism offers multiple opportunities: directly, by raising awareness and providing income support, and indirectly, by promoting local communities' participation, which is a basic factor for successful sustainable development. The new Alte Marche tourism brand is also coherent with The Agenda for a Sustainable and Competitive European Tourism (EC, 2007), which underlines tourism as a key factor for the conservation and development of destinations thanks to main features such as natural resources, cultural distinctiveness, social inclusion, security, and the wellbeing of local populations.

SOCIAL RESPONSIBILITY

The issue of and the debate on social responsibility have been transversal in Europe and Italy in the last decades (Commission of the European Communities, 2001;

Albano et al, 2012; Coppa & Sriramesh, 2013), across the media, government and local institutions, as well as involving different social and economic (private and public) stakeholders, universities and research centres. Conversely, however, businesses have been very little involved, although the social economy employs over 11 million people in the European Union, accounting for 6% of total employment (Monzòn Campos et al., 2011). Social economy includes bodies with different legal status, e.g., cooperatives, foundations, associations, mutual societies, many of which are also social enterprises. Social economy, according to the EC (2015), aims at making profit for people rather than for investors and owners, and is particularly suited to enterprises that implement a bottom-up approach to governance and that promote co-participation. In rural tourism, social responsibility could be the mainstream approach to reduce tourism's negative impacts on the environment and local communities. Social enterprises (EC, 2015) contribute to smart growth by responding with social innovation to needs that have not yet been fulfilled; they support sustainable growth by embedding the socio-environmental impact into the business, and by their long-term vision, as they are one of the main key factors in inclusive growth due to the emphasis on people and social cohesion (EC, 2011).

Social responsibility should represent an important issue concerning the rise of committed, sustainable rural tourism development. In the European framework, especially in Italy, social responsibility and fair trade should connect to different local manufacturing industry organisations.

Urban-rural economic, social and environmental gaps (UN Habitat, 2019) might be closed by implementing integrated planning goals. Addressing place-based development plans means reviewing, adapting and using locally relevant regulatory instruments and methods, and should encompass such issues as environmental protection, climate change, land use, and infrastructure and transport. An appropriate legal framework represents a concrete foundation for the creation of social enterprises, and for capturing their specific features and needs. A legal framework at national level brings clarity to the definition of social enterprises, their mission and their activities (OECD, 2013). A broad debate on specific regulation is still missing in the Marche Region (Figure 1-2). Local enterprises and public institutions have been weakly involved with social and environmental responsibility in the tourism sector. A positive input should be given by new regulations on the circular economy that the Marche Region is going to define (approval from the regional council is still pending). Regional regulation may not be enough to support social public and private community responsibility, but it can be an important step forward.

The tenet here is that the local population should be involved by municipalities in all main decisions, and this should take into account the social, economic and environmental local context. Moreover, local policy makers should stimulate and promote co-creation processes, involving both the public and private sectors. A sustainable

community cannot ignore the fundamental role of social responsibility. The two cases under analysis fall into a regional framework of deep economic crisis. The Marche regional manufacturing sector has been in a critical situation since 2008, which became even worse after the devastating earthquakes of 2016. Efforts to recover the region need to integrate such important aspects as social cohesion, alternative socio-economic models, and sustainable development (improving energy efficiency, reducing waste and environmental impacts). In a new responsible tourism in rural areas, the landscape, the natural and historical heritage, as well as local food and wine could play a key role in local development and economic recovery. Social economy, according to Social Economy Europe (2015), provides a short-term "buffer" in a crisis situation. If such benefits are properly enforced, it is possible to argue that social economy is an essential element for a successful way out of the crisis (anticipation and response to unsatisfied needs, to structural changes) and for a new model of economic growth, such as sustainable rural tourism.

Rural tourism experiences play a key role, be it through natural resources and agriculture (wine and food excellence) or through rural built heritage, cultural heritage, historical towns, material and immaterial cultural values of local communities, energy sustainability, rural and coastal linkages. For innovation, the municipalities must find a way to involve multiple synergies and generate employment (incomes) for all stakeholders, but especially for young people, to give them motivation to live in inland areas (Bocci, 2015). Circular economy and social responsibility might be the leitmotifs of overall actions, implicating all sectors of the economy, involving private and public stakeholders for sustainable future development.

THE TWO CASES: FRASASSI AND SASSOFERRATO

A growing body of research points to underground assets as an important local economic resource (Che, 2011; Mata-Perelló, 2018; Kimic et al., 2021; Smaniotto et al. 2021). Also, the COST Action Underground4Value[2] is devoted to better understanding the conservation, valorisation, and management of an underground build heritage, and these through the lens of a community-led development process. This approach links two relevant issues: underground heritage as a unique cultural resource, and the local community, which greatly benefits from this resource (Pace, 2021).

This essay explores how underground assets could be managed to increase responsible tourism, ensuring environmental and natural protection, putting placemaking and bottom-up planning processes in place towards more sustainable and responsible development.

[2] https://www.cost.eu/actions/CA18110, www.underground4value.eu

Territorial framework

The two cases under analysis, Frassasi Natural Caves and Cabernardi Archeo-Mining Park, and the corresponding municipalities of Genga and Sassoferrato, are located in the Apennine area of the Province of Ancona, Marche Region, Italy. As with most of the cultural and natural heritage in inland areas, the problem is reaching these places. The Genga municipality is crossed by the national route SS76, while Sassoferrato is about 15 km away from that road. Over the last twenty years, a great part of the SS76 has been under construction, as part of the Quadrilatero Project, the large road infrastructure enlargement project to allow faster connections to the Marche and Umbria Regions. While waiting for the SS76 enlargement completion, the population has also had to face the construction works on the Pedemontana, a route project born in the 1970s to provide fast connections to the Apennine inland areas along the Marche Region. The long-awaited completion of the SS76 has also put the environment in danger, as it suffers a process of permanent violation by land take. Maybe it would be better not to invest so much (more than 1 billion Euros) in new infrastructures, but rather to ensure the maintenance of the existing road network. On the other hand, the more sustainable track doubling of the railway line Ancona-Rome has been running for more than thirty years, but today the trains connecting the two destinations are slower than they were some years ago.

While Genga is located inside the Regional Park of the Gola della Rossa e Frasassi (Figure 1), Sassoferrato is adjacent: the protected area is essential to develop rural tourism experiences to preserve the amazing landscapes and local biodiversity, and support co-creative actions to strengthen the collaboration between the two underground sites.

Fig. 1: Regional Natural Park of Gola della Rossa e Frasassi. All photos: Bocci (2021)

The Frasassi Caves

The Frasassi Caves, a karst cave system in the Municipality of Genga, were discovered in 1948 by a group of speleologists. In 1970 other speleologists discovered further wide cavities (about 30 km in length). Stalactites, stalagmites, lime-castings and crystallised small lakes, which represent the most beautiful element of the caves (Figures 2,3), are the result of the prolonged rain water infiltration work on the rocks.

In 1972, the municipality of Genga and the province of Ancona established the Frasassi Consortium to manage the Frasassi Natural Caves and facilities (parking area, ticket office, an outdoor market). A tunnel of more than 223 m was built in 1973-1974 to provide access to the caves, connecting the entrance to the Deep Ancona cave. The tunnel is a comfortable walk of approximately 600 m, it is however not accessible to disabled people. Visitors can access the Caves only in guided tours. The caves run for about 30 km, and access to the other walks/journeys is allowed only to speleologists.

Fig. 2: The magnificent Room of Candles (sala delle candeline) is one of the most imposing chambers in the Frasassi Cave

The caves are famous all over the world and they constitute one of the most attractive landmarks in the Marche Region. The caves are open around the year, except for one month during winter (in January-February) due to ordinary maintenance works. In 2019, 278,570 tourists visited the amazing natural caves; in 2020, after the beginning of the pandemic, the number decreased to 155,683 visitors. Due to their astounding underground heritage value, the caves should boost local tourism, and promote the linkage to other interesting regional facilities, e.g., the Regional Natural Gola della Rossa Park, Valadier's Church, San Vittore Abbey; still, is quite

difficult to arrange an integrated tour. For the last 50 years the Frasassi Caves have been managed without any involvement of the local community.

Fig. 3: Stalactites and stalagmites inside the cave

The Cabernardi Archeo-Mine Park

The Cabernardi Archaeological-Mine Park covers the sulphur mine area located mainly in the Municipality of Sassoferrato. The mine was the greatest sulphur mining site in Europe until it was closed down in 1959. In the last 25-30 years a co-creative approach crafted by the local community – ex-miners and their families – gave a remarkable impulse to the development and promotion of the mine and the site. Today it comprises a museum, congress hall, services and facilities, in addition to the mine installations (Figure 4).

The mine employed up to 1,600–1,800 miners. Most of them, and their families, lived in the Cantarino Village, built by the Montecatini Society, the national company. The village was completed in 1919, with the necessary infrastructure and facilities, including a school, playgrounds and recreational areas. It is still today a lively neighbourhood.

Since 1983, a group of ex-miners and their descendants decided to revive the tradition to celebrate in-situ Santa Barbara's day (December 4th), the patron saint of miners. This celebration gave ex-miners and their families the opportunity to start collecting photographs and objects related to working in the mines. In 1992 these memories materialised in a museum, completed today with a collection of minerals and further objects (i.e., guardian hats, workbooks, boots, and lamps) donated by

miners and their families since its inception. In 1999 the museum was installed in the old primary school building, as a result of the partnership between the Sassoferrato Municipality and the cultural association "La Miniera Onlus". This association, established in 1996, aims to preserve and enhance the history and traditions involving the mine and the neighbourhood. It also managed the museum and the mine archaeological park from 1997 to 2021.

Fig. 4: Entrance to Cabernardi Archeo-Mine Park

In 2019, about 2,600 people visited the park; in 2020, with the COVID restrictions in place, about 1,300, a significantly smaller flow of tourists compared to the Frasassi Caves. Since 2021, the Happennines Cooperative has been the local tour operator, which is also in charge of the park management. For this reason, the cooperative plays a crucial role in the process of the park's valorisation and promotion. Happennines is pushing for a networking approach to link the Archeo Mine Park with further cultural heritage assets in Sassoferrato (Sentinum archeological site, MAM's - a coworking space with a permanent and temporary modern art collection, other art museums and collections, Albornoz Fortress, Conti Atti's Abbey, etc). The park is thus becoming one of the most attractive sites in the region. To promote local development, Happennines, in close contact with local small and medium enterprises, is strengthening the social approach of important manufacturing, food and wine producers. Against the backdrop of an amazing landscape, the Cabernardi Archeo-Mining Park offers a unique visit experience, allowing visitors to appreciate a rich culture and a beautiful nature itinerary. Residents are the most important stakeholders to improve and strengthen the history and memory of the Caberardi mines. However, the decreasing population of this inland area needs to be given further attention to keep these sites alive and attract new residents, not only tourists.

UNDERGROUND HERITAGE VALORISATION IN SMALL RURAL COMMUNITIES: FINAL CONSIDERATIONS

A co-creation process is a win-win approach for adding value and promoting underground heritage resources in rural areas. Italy is extremely rich in cultural and natural heritage –including underground built heritage. The valorisation of such heritage assets has increased in the last decades, and the local communities are often involved in promoting them. Local associations and cooperatives play a central role in this process (Pace & Salvarani, 2021). Such involvement is fundamental to provide support to the small scale economy. The Frasassi Consortium, for example, made the decision to employ local people as much as possible. This is, however, not a collaborative or co-creative bottom-up approach. Cabernardi Archeo Mine Park, initially managed by the Onlus Association, and then by the Happennines, bears witness to the importance of the cooperation and involvement of young local professionals, who are highly motivated to strengthen tourism and engage with local stakeholders. The assets and the tourist flows in the two cases are very different (as demonstrated by the figures), but experience shows that co-creation and bottom-up processes are the best way to manage complex local heritage and community development processes, and are the most effective element to achieve sustainable results in terms of broad cultural and natural heritage valorisation and promotion (Smaniotto et al., 2021).

Heritage valorisation in terms of placemaking means involving local communities in defining the best concrete development aspects to improve, sharing actions to be implemented and goals to be reached. Placemaking is a bottom-up process that requires continuous engagement, and strengthening efforts in co-creation, design and innovation processes. The Italian approach concerning different local experiences seems to be largely different: placemaking and co-creation processes are often claimed, but rarely supported. A smart community needs to integrate social, planning, environmental and economic aspects to boost co-creative approaches.

The collaboration between the two underground sites with the Natural Regional Park of Gola della Rossa e Frasassi could strengthen the tourism of scholars. The two assets have a common ground: scholars are very interested in visiting natural caves, and they are eager to know about life in the mines as well. The Regional Park could play a more active role through its educational services. School visitors (also involving families) should be considered a key element to improve responsible tourism and to play an important role at regional level.

Underground valorisation for the Genga and Sassoferrato communities should involve creating and supporting a process to develop a local tourism economy based on their natural underground sites, strongly connected with local natural and cultural outdoor heritage.

For this reason, local communities should be leading players in this new approach. Rural tourism development is still undefined and ineffective concerning local

communities' engagement. Therefore, regional development needs to create new approaches for small rural communities. There could be different approaches, according to focus, i.e., on local cultural, social and economic resources. The overall aim of the two case studies is to explore their own features, drivers and potentials to support rural areas in current challenges and to improve their sustainable development. Social responsibility by local stakeholders and involving young people should be key in each enhancement effort to foster local culture and tourism economy. The lessons from these two cases suggest, at this early stage, that sustainability should be strongly linked with the conservation and development of natural and cultural (including underground) heritage, and all these topics should be integrated through the same goals. Driving new approaches at local scale in inland areas has to be one of the main issues for the near future and it must aim at integrating environment and landscape valorisation with the purpose of increasing a sustainable rural tourism economy.

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A framework to grasp socio-territorial relationships: a conceptual path

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Abstract - *This chapter proposes an introductory conceptual framework to better understand some aspects of everyday relations of people and spaces. From the perspective of anthropology of space, it first provides a reflection on issues that are important for understanding these relationships, to then, in a second step, address the relevance of walking as a method to trigger a sensitive path. This chapter aims to raise the interest for urban planning that is more attentive to the multidimensionality of socio-territorial relations. To explore the sensitiveness of urban space it is important to consider (a) the perspective of users in terms of symbolic dimensions, socio-spatial and cultural practices, and sense of happiness and well-being; (b) the articulation between behavioural dimensions, sociocultural dynamics and the environment; (c) the approximation of concepts and categories to understand space from the perspective of different disciplines.*

Keywords - Attentiveness, socio-territorial relations, walking, urban planning.

Resumo - *Em modo iniciático, o presente capítulo propõe um itinerário sensível para captar determinados aspetos do quotidiano das relações sócio-territoriais. A partir de uma ótica da antropologia do espaço, primeiramente apresentam-se certos tópicos que se julga importante atender. Na sequência, discute-se a pertinência do uso caminhado da cidade como método no acionar de um itinerário sensível. O objetivo é sensibilizar para o interesse de um urbanismo mais atento à multidimensionalidade das relações sócio-territoriais. Desde uma ecologia sensível do espaço urbano, aqui importa considerar: (a) a perspetiva dos utilizadores do espaço ao nível das dimensões simbólicas, práticas sócio-espaciais e culturais, satisfação e sentimentos de bem-estar; (b) a articulação entre dimensões comportamentais, dinâmicas socioculturais e meio ambiente; (c) a aproximação de conceitos, categorias e noções de entendimento do espaço, e de diferentes áreas disciplinares.*

Palavras-chave - Perceção, relações sócio-territoriais, caminhada, planeamento urbano.

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INTRODUCTION

The unquestionable fact that space speaks in the plural (Bettanini, 1982) echoes with special emphasis when the subject is urban space. This plurality conveys a heterogeneity of meanings, elements, forms, practices, processes and relationships that are of interest to know and understand for urban planning. However, when it comes to the reflection about how to create or recreate urban space, such overlapping multidimensionality is not always considered. Understanding this multidimensionality is not an easy task, because it infers complexity, ambiguity, diversity, conflicts and, in many cases, divergences in understandings, needs and interests.

Across the multidimensional point of view, knowledge production and acting, there is the need for a dialogue among different disciplines and knowledge domains. This refers to the fundamental issue of adopting an inter/transdisciplinary perspective. Nevertheless, despite being aware that inter/transdisciplinarity is essential in urban planning, the present reflection does not directly highlight this issue, assuming it as intrinsic. Thus, in urban planning, it is important to be aware of socio-territorial problems, potential and needs. To achieve this, it is necessary to learn to be more sensitive to the variety of aspects and dynamics that shape the urban space. This derives from a sensitive everyday life perspective (Ferreira, 2016) or, as Thibaud (2010) advocates, from an urban ecology of the senses, which implies a sensory perception of urban space, and relates the physical aspects of space to the social experience made in/through it. The objective here would be "to capture, access, restore the aesthetic context (aesthesis), as a perception, through the senses, of the common urban experience" (Ferreira, 2016: 86). Therefore, it is essential to train our senses so that, gradually, we become more sensitive to the multiple aspects, relationships and processes that interact daily in space, and to the urban *ambiance* that is created in space. The concept of urban ambiance is understood here as being holistic and, in general terms, it involves the character and/or atmosphere of a place as captured by the individual, as a physical, social and cultural reality (Silva and Duarte, 2020; Thibaud, 2000, 2010, 2012; Ferreira, 2016).

To address a sensitive pathway to grasp the socio-territorial relationships in urban areas, in particular in public spaces, from the perspective of anthropology of space, it is relevant, first, to introduce some topics considered central. These topics are but a few examples of the richness and plurality that characterises space and are not intended to be exhaustive. The aim is to raise awareness to the importance of developing a pathway to approach socio-territorial relations, such that give dynamism to and strengthen:

- The perspective of users, considering different dimensions, such as symbolic, socio-spatial and cultural practices, and senses of happiness and well-being.
- The articulation between behavioural dimensions, sociocultural dynamics and the environment.

– The approximation of the concepts, categories and understandings of space, as well as different disciplines.

Subsequently, walking through the city as a (experimental) method is discussed as an opportunity to devise a conceptual path to grasp socio-territorial relationships.

SPACE USE, APPROPRIATION, DELIMITATION AND PERCEPTION

Observing everyday micro-geographies of use and appropriation of space contributes to the understanding of the relationship between individuals/groups, their behaviours and practices, physical and functional resources, and the sociocultural and symbolic resources in a given spatial context (Barker et al., 1973; Wicker, 1979; Rapoport, 1980; Low, 2000, 2000a). These aspects also help to detect the propensity of socio-spatial contexts to become vandalised, segregated, excluded, or associated with a sense of insecurity. Such observation helps to identify socio-territorial continuities and discontinuities, to understand socio-spatial behaviours and practices in terms of needs, control, culture, experiences and meanings in the course of daily life, and at times which are characterised by their circular movement, often related to ephemeral experiences or more constant meanings (for example: rituals, parties and celebrations). In this observation, it is important to recognise the characteristics of those who use and appropriate urban space, their points of view and the meanings they attribute to the space. Thus, the relationships between everyday micro-geographies of use and appropriation of space, spaces (indoor/outdoor, public/private, semi-public/semi-private), social behaviours and the physical environment are central to the understanding of the lived space.

The organised, used, and appropriated space is a represented space; observing space helps to identify a social reality (Lévy and Segaud, 1983; Ferrara, 1993). An organised space – with forms, limits, orientation and direction – as a represented space is a communication vehicle. This reflects on the other hand, a capacity for environmental perception, on the part of individuals, which contributes to the construction of a mental configuration – an image – that serves as information, psychic-spatial reformulation and reflection. The analysis of images and representations of space allows us to establish a set of associations that help us to better grasp the relationship between space, culture and society.

In understanding these dynamics, it is also important to identify the rationale behind building limits and borders. A boundary can be a demarcation line, as seen in defining political and administrative boundaries. Nevertheless, from a sociocultural perspective, the idea of limit emerges as a symbolic and interstitial landmark. Understanding the ways in which individuals and groups construct, destroy or reinforce certain boundaries is important in a socio-territorial analysis. It is also vital to identify the relationships between internal and external spaces, dynamics of inclusion and exclusion (Sibley, 1997). Moreover, the space delimitation process introduces logics of differentiation in the socio-spatial organisation, and in the

representations elaborated on the different socio-spatial orders. This is because limits and borders serve to mark differences, distinctions and contrasts (Low, 2000; Menezes, 2004). A liminal space is ambiguous, and it can be a space of comfort and security, of a leisurely transition between spheres of space, or between one social setting and another. However, it can also be a space of anxiety and transgression, of segregation and exclusion (Sibley, 1997). Being attentive to the processes of social and spatial demarcation helps us to address the relationships between what "is" and what "is not" – danger, threat, insecurity – between "near" and "distant", between "us", "them" and the "others" (Menezes, 2004).

THE METHOD IS SIMPLE: WALKING AS A TACTIC APPROACH

When walking, a "tactile apprehension" of the urban space takes place (Certau, 1990). This provides a "tactile approximation" (Lima, 2013) of the social, spatial and cultural logics that manifest themselves in the urban territory. For Schultz (2016), the act of walking also enables an approximation of study, design and planning problems. This is because this act deals with a much richer initiative than the mere extrapolation of studying problems from sitting at a table.

In urban planning, the act of walking to put into action a sensitive perception of urban ambiances can be considered a "method and source of information for critical reflection" (Lima, 2013: 203). A method that, according to Solnit's (2001), is not an analytical act, as it is improvised; Schultz (2016) calls this experimental.

> *Walking is one of the most ordinary and simple ways of exploring landscapes. However, applied to design practice, it must be refined as an experimental method supporting a complex creative process of gathering knowledge, generating ideas, and reflecting and sharing findings immediately on site. (Schultz, 2016: 136)*

For Schultz (2016), the act of walking as an experimental method is related to the firmness and long duration of the elements that characterise the act – "strain, rhythm and intensive perception". These elements enable three modes framed by the method: (i) discovery mode – related to the engagement of those who investigate in the territory, giving rise to an intensive perception; (ii) flow mode – one that stimulates intuition; (iii) reflective mode – supportive support for the organisation of ideas. In one of the experiences of applying the method, the author refers to the use of the idea of game, where anyone who was going to walk could follow the following rules:

> *1) Walk the whole day; 2) Choose a direction rather than "the right path"; 3) Experiment with following beaten tracks and with crossing the terrain by following a straight line; 4) Walk alone most of the time, at least for half of your journey; 5) Start a conversation with people you encounter on the way; 6) Observe places with all their scents, flavours, views and textures; 7) Open up to the landscape. Play walking. (Schultz, 2016: 137).*

The "walk as a method of discovery and informally woven relationships and events in the city's territories" (Fortuna, 2019: 8), enables a "tactile approximation" (Lima, 2013) to the particularities of the territories, approaching the possibility of implementing a closer perspective and from within, as represented by the ethnographic method (Magnani, 2002; Menezes, 2019). In addition, with regard to urban discipline, it can contribute to inverting more conventional perspectives, from above and outside (Bereinstein Jacques, 2008). If the required sensitivity entails paying attention to our senses – sight, hearing, smell, touch and taste – the techniques and tools for collecting information and recording it are wide-ranging and varied – establishing an informal conversation with space users, taking notes, drawing, making diagrams and maps, making visual records, organisation charts and diagrams; apps, a notebook, a camera and video, etc. should be used for this purpose.

WALKING AS AN ACT THAT CONTRIBUTES TO SENSORY IMMERSION IN THE TERRITORY

The act of walking plays an important role in urban mobility, being potentially available to everyone, as are the opportunities it creates as an act of roaming, thus enabling wandering, relating, feeling, knowing, experiencing, reflecting (etc.). The importance of walking resonates with the importance of creating more and better conditions so that it can be done with quality, comfort and safety, which is the order of the day in our cities. However, when the role of walking is introduced here in the construction of a sensitive itinerary to capture the particularities of the territory, we are not really referring to creating urban conditions to enable walking. Here, the qualities enhanced by walking itself are seen as beneficial, in which the slow pace, firmness, effort and rhythm provide opportunities to establish more and more connections, immersed in the city's territories. But then again, the challenge here is how to take advantage of this possibility of immersive connection so that, from the act of walking, a sensitive itinerary begins to capture the socio-territorial relationships in everyday life.

Let's see, then. When walking, we come across people, how they relate to each other and with the physical environment that surrounds them; but also with bodies, clothing, sounds and noises, smells and flavours, behaviours, practices, needs, potentials, micro-geographies of use and appropriation of space (Marchal and Stébé, 2011), and the constitution of micro-territorialities (Fortuna, 2012). However, deepening knowledge about socio-territorial dynamics requires a broad and demanding theoretical and methodological framework, dedicating time to the study and analysis of observed phenomena, of which the journey is, above all, a support. This is because, for example, it is important to know the complexity with which the interactive relationship between people and spaces is manifested, and how this relationship affects behavioural frameworks, constituting urban environments (Carr et al., 1992; Duarte and Pinheiro, 2019), thus taking an integrated approach

that includes the natural and physical qualities of the space, the people who use it, their cultural and demographic backgrounds and underlying socio-economic status. Moreover, this also considers that these aspects cover the contexts of the development of settings, the existing structures in the area, the history of the place and the inherent socio-cultural traditions.

The act of walking allows for the creation of an intense and sensitive perception of people's territorial experience, supporting the inceptive nature of this integrated approach. Here, walking as an experimental method of discovery, flow and reflection, following the reasoning of Schultz (2016), enables us to better capture particularities and find questions, but also new ideas, which, from another perspective, helps to counter certain trends in the urban discipline – in a more conventional or even current perspective, such as certain approaches adopted in line with what is conventionally designated as smart cities. That is, the act of walking as a method, by tactically approaching urban space, helps us to invert trends that address social life with an emphasis on counting numbers, identifying the type of people and uses of space. It also assists in overturning more architectural approaches, which privilege the description of physical and morphological-type characteristics; or even offset the adoption of macro-approaches, from the outside and above.

FINAL NOTES

The goal of this chapter was to contribute to the development of more sensitive approaches to foster a deeper understanding of socio-territorial relationships in the urban space. It was conceived as a preliminary step to address the multidimensionality which characterises the connection between space, culture and society. The act of walking is suggested as an experimental method to sharpen the senses to grasp the plurality of these relationships.

It is, however, essential to consider a more operative, dynamic and participatory technical and methodological perspective when addressing urban issues. In order to ensure the efficiency and effectiveness of these objectives, socio-spatial analyses should be:

- **Dynamic** – in order to avoid the production of static and/or immutable images and characterizations of the contexts of involvement and scope of the dynamics of action and urban intervention.
- **Interactive** – in order to promote an articulated reading between different analytical points of view (architectural/urbanistic, socio-anthropological, historical, economic, archaeological, technological, sanitary and health-related, and so on). It is important to provide an interrelated reading of the dimensions and dynamics that constitute and are constituted in a given context of analysis. This promotes a better knowledge of social, spatial, cultural, functional, institutional and operational issues, as well as the definition of more integrated and interactive measures and actions.

– **Participatory** – in order to foster the integration of the reasoning of social actors and the knowledge of their propositions in the placemaking and planning process.

The tactile approximation of the territory as provided by the act of walking enables us to be more sensitive to the different aspects that influence our own territorial experience, as well as that of other people. This enables us to gradually create a more integrated and multidimensional understanding of the various aspects that affect socio-territorial relationships. This is a starting point considered essential to define pathways that contribute to a better city.

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How daily life impacts social science

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Abstract - *I would like to put forward my point of view as a French researcher on my Portuguese field of research (Mouraria/Lisbon). This reflection is thus the fruit of a back and forth between frequently used social science concepts – gentrification, fragmentation and segregation – and my own field experience. More precisely, I seek to understand why a gap exists between what we observed and these concepts. My hypothesis is that one possible answer lies in a conflict of temporalities: those of institutions and public organisations, those of companies, those of researchers and, finally, those of individuals who fall outside the previous categories. Starting with the latter, I approach the concept of daily life as a relationship between time and space, which is part of a process of remoteness based on the minimisation of risk as envisaged by Heideggerians. This tendency towards spatio-temporal proximity often contradicts our theoretical concepts.*

Keywords - Temporalities, spatialities, concepts, spatial being, daily life.

Resumo - *A reflexão proposta é a visão que tenho como investigador francês sobre a minha área de investigação portuguesa (Mouraria/Lisboa). Esta reflexão é, portanto, fruto de um vai-e-vem entre os conceitos das ciências sociais frequentemente utilizados – a saber, a gentrificação, a fragmentação e a segregação – e a minha própria experiência de campo. Mais precisamente, busco entender por que existe uma lacuna entre o que observamos e esses conceitos. Minha hipótese é que uma resposta possível encontra-se num conflito de temporalidades: as das instituições e órgãos públicos, as das empresas, as dos pesquisadores e, por fim, as dos indivíduos que não se enquadram nas categorias anteriores. A partir deste último, abordo o conceito de dia-a-dia como uma relação entre o tempo e o espaço, considerada como um processo de desafastamento baseado na minimização do risco tal como vislumbrado pelos heideggerianos. Essa tendência à proximidade espaço-tempo muitas vezes contradiz nossos conceitos teóricos.*

Palavras-chaves - Temporalidades, espacialidades, conceitos, ser espacial, dia a dia.

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INTRODUCTION

In the course of my research, I have encountered a number of concepts promoted and popularised by the social sciences. In France, among the best known are gentrification, fragmentation and segregation. These concepts have constituted a framework for the analysis of spatialised social processes that can (or could) serve both scientific and civic ambitions: scientific because our role as researchers is to generate knowledge; civic because the collective appropriation of this knowledge constitutes an important element of democratic debate. Based on these concepts, we produce narratives that are made available to public actors, whether they are institutional or not, so that they can use them to debate and act in the public space. Over the past forty years our approach has however been confronted with two obstacles: on the one hand, these concepts have been exhausted and are no longer infallible, either from the epistemological point of view, or from that of our observations in the field; on the other hand, although the institutional public actors easily grasp our concepts, citizens - especially when they are the subjects of our interviews - never use them, nor do they present a reality that could correspond to these concepts. As we enter the field of research, we need to consider the reasons for this dual difficulty and how we can avoid the pitfalls.

THE THEORETICAL DEBATE ON CONCEPTS: GENTRIFICATION, FRAGMENTATION AND SEGREGATION

In France, criticisms began within the social sciences by sociologists such as Bourdin and Paquot. The former doubts the conceptual relevance of gentrification and invites us to 'deconstruct' it (Bourdin, 2008: 33-37); while the latter writes about socio-spatial fragmentation: 'to say that a city is fragmented implies that it used to form a homogeneous whole and that from now on it is made up of different territories, like so many disparate pieces of a necessarily incomplete jigsaw puzzle' (Paquot, 2002: 113). As a result of these objections, fieldworkers have struggled to find a sufficiently tangible framework to justify certain research and form relevant conclusions. Some have sought scientific compromises: with regard to the central districts of Lyon, Authier (1995) concluded that a real process of gentrification could not be questioned, but he argued that its scope remained limited. Giroud (2007) attempted to link the resident (as an autonomous individual, i.e., capable of empowerment in public action) with the collective action of the group to which he belongs. Through what Giroud called 'resisting while living place', he perfectly illustrated the limits evoked by Authier concerning the process of gentrification.

Other researchers have shown that populations are capable of organising their own self-segregation and - whether rich or poor - can promote logics of self-segregation (Gaspar, 2003 and Capron, 2006). By pluralising the same concepts, some thought that they could be saved from extinction (Chabrol et al., 2016). Madoré (2013) more stringently denounces the works and discourses, which - according to him - without

scientific basis put forward an increase in socio-spatial fragmentation. In this, Madoré joins Préteceille (2006) in questioning the Paris region. To conclude this brief account of criticisms laid against the concepts that we are tasked with mobilising, I will mention the recent work on Nantes and Montreal which asserts that 'the right to a neighbourhood' and 'the social acceptance of gentrification' are not incompatible (Ghaffari, 2021).

The weakening of these concepts is due as much to theoretical criticism as to the numerous field studies that contradict their relevance. We must also add thereto the attempts to change the paradigm, thus resulting in the growing interest in mobility, whether physical, material, affective or opinion-based, which has led researchers to question the operational nature of the notion of territory on which these same concepts operate. Some researchers, such as Ascher (1995), concluded very early on that everything was in flux and that the future of cities no longer depended on their territories but on taking into account mobility and exchanges, independently of the location of societies. Fundamentally, we can ask ourselves: is the exhaustion of our concepts linked to the exhaustion of territory in research In 2007, around twenty French geographers met at the 'Entretiens de la Cité de Grenoble' in an attempt to save the concept of territory or to justify its importance (Vanier, 2009). The concepts are certainly exhausted, but they are not yet dead.

When we start a scientific research project, we are not only entering a field where inhabitants [Isaac Joseph would have said 'considerable passers-by' (1984)] are traversed by remarkable dynamics; we are simultaneously entering a battlefield that presents two types of risks: that of a scientific approach that is impoverished with regard to its aims, and that of conceptual disorientation for the researcher. This is why we must return to the actor-subject, and try to examine what makes it difficult to link him to the concepts that we mobilise.

UNDERSTANDING THE DIVERSITY OF TEMPORALITIES

We have all observed that the concepts that we utilise in the social sciences are rarely used by the people living in a given territory. When we interview the residents of a neighbourhood - as experienced by me in the working-class neighbourhood of Mouraria - none of them use the terms gentrification, fragmentation or segregation. None of them mention anything that could be even a rough definition of these concepts. It is as if what we identify in the scientific field is foreign to these populations.

Conversely, institutional, professional or associative public actors appropriate and easily use these same concepts. For some, it is a matter of promoting their aims in the public arena by embellishing them with scientific legitimacy; for others, this same legitimacy grants access to a public arena (Cefaï, 1996) where controversies and conflicts over the use of territory are constructed. The mastery of concepts is the result of what researchers call 'the rise in generality' (Boltanski and Thévenot, 1991): in addition to legitimising the justification of an actor's discourse, it makes negotiation, arrangements or agreements possible.

The associations created around dominated actors experience difficulties similar to those of the researcher: a relative indifference on the part of the residents they are supposed to mobilise and represent. These associations are, however, not always the product of dominated actors: historical leaders have often been politicised, whilst others may not be natives, or - thanks to social media and the Internet - may not reside, or even have been to the territory in question. All the associations already have a certain empowerment and autonomy. When I study the number of members in these associations, I see that there are few contributors, and some even receive public subsidies. When they organise events in the public space - for example, on the subject of "right to the city" or "housing" - participants are often limited to the most dedicated activists, sometimes accompanied by the most blatant victims of public policies. With, of course, a few exceptions, the majority of the populations concerned remain absent.

We could apply the same analysis by adopting the point of view of public institutions: rehabilitation or requalification projects, and more generally land-use planning projects, remain poorly used. Despite the legitimacy conferred in a democratic system by the vote, populations are at best indifferent, at worst hostile, and otherwise intermittently suspicious. This is likely the reason for efforts to develop participatory and so-called permanent democratic modes in most municipalities. Nevertheless, if we look at the case of Lisbon, between 2007 (date of the first participatory budget) and 2019, participation barely exceeded 50,000 votes (2016) out of 500,000 inhabitants.

Working on socio-spatial interactions, their characteristics, but also their effects, translated into a narrative and supported by concepts becomes in this context a challenge. Like all young researchers, my first contact with the field was particularly challenging: The municipal and associative doors were relatively easily opened to me, whereas those of the residents, passers-by and inhabitants closed very quickly. When I asked them if they would agree to take part in interviews, the answers were of two types: They replied either that they did not have the time, or that they did not consider themselves competent, and referred me to association leaders. The difficulty with going through associations is that they filter topics according to their interests. Such an attitude remains useful for analysing the postures and discourses of associative actors, but it deprives us of access to a point of view that is essential to our research: that of public actors who are not part of institutional, associative or professional arrangements, and who are by far the most numerous in the spaces we are studying.

During the preparation of my thesis (Galhardo, 2018a), and in light of the situation, I adopted a strategy that drew parallels to anthropological methods: I entered the neighbourhood early in the morning, I had breakfast there, and then spent the day in the area until the evening, leaving after dinner. I ate meals in the same places as the residents, sometimes at the same table. I visited the same stores, bought the same

products, and took naps on the public benches between two strolls. Whenever the opportunity arose, I conversed with the residents on subjects that had absolutely nothing to do with my thesis work: the banalities of daily life... (Mondada, 2003). After a few weeks, a resident approached me and asked if I had seen José? Of course, I didn't know any José in this neighbourhood, but I understood that I was part of the landscape. What does it mean to be part of a landscape? It is not being an individual of the indigenous community, nor even being fully recognized, but being in tune with the temporality of the inhabitants of the place, in the place they inhabit.

I could therefore envisage interviewing them, but I could not do so in the same manner as the institutional and associative actors. With the latter, one must make an appointment, agree on a place and meet with a pencil, paper and tape recorder on the table. Here too, it is a question of time: the adjustment of the researcher's temporalities with those of the institutions (or associations) does not require the same effort: it is contractual, and each has a particular interest in it. With the residents, we must seize the moment when they pass within our reach, we have to walk beside them, follow them wherever they go, sit on a bench and sometimes lie down on the steps or have a drink in a bistro. In other words, we have to renounce the sacred time of municipal public action to enter the profane time of the residents' daily life. In the case of residents, an arrangement is almost impossible: one must be tamed, like the Fox in *Le Petit Prince* de St Exupéry.

Time plays an essential role in the encounter between the researcher and their subject: they must strip themselves of scientific time to enter into a vernacular time. The situation is not comfortable because it is not always possible to record these interviews so as not to betray the relationship with my interlocutors. It is these difficulties that led me to the method of analysis by photo-elicitation (Bigando,2013). This method consists of analysing a photographic production proposed by the subjects. Under these conditions, the subjects accept to be recorded because they produce a narrative that they can control, this rebalances the researcher-subject relationship. Because of this method, the subjects suspend the contingencies of their daily lives to tell you about their spatio-temporal relationships through a photographic narrative. We are very close to a sound photo album construction, which deals with an inventory of relations to the dynamics of familiar places.

THE REVELATION OF THE "SPATIAL BEING"

Homo quotidianus cannot apprehend the concepts we use because they cannot be perceived in the short term or in a stable space. The speed and temporality of the processes of *gentrification*, *segregation* or *fragmentation* diverge from those of everyday contingencies. The same is true for spatialities: while the concepts only concern a precise scale, daily life positions the public actor in a wide variety of scales (home, streets, neighbourhoods, city...). Speaking of *gentrification* implies denying the temporalities and spatialities of the public actor. The latter enters a blind spot

where it becomes invisible for institutions, associations and, no doubt, for many researchers. What other alternative is conceivable here?

By carefully studying the order of presentation of the images and the nature of the discourse of the subjects interviewed, I identified a number of recurring matters. Initially, I asked each of my subjects to choose 10 photographs to present their neighbourhood to me. The subjects were then asked to present each photograph to me in any order they wished. It is important to remember that the studied panel includes subjects of different occupations, age and sex. None of them knew each other or the other subjects being interviewed. During the interviews, all residents spontaneously proposed a narrated progression of photographs in the following order:

1. images of the place where they live,
2. images of the social places they frequent,
3. images of urban representations, beyond the first two scales.

The narratives therefore all begin on a small scale (around the home) and a short time frame (that of daily life). They then extend to a larger scale (that of the city) in a longer period (the life of the city). The last series of photographs, corresponding to the representation of the city, evoke municipal interventions and sometimes the action of neighbourhood associations. I observed that the subjects' narration was first precise (in the small spatio-temporal scale), and then became uncertain (in the large scale). This uncertainty is not only the result of disinterest or ignorance, but is also shaped by the idea of risk in daily life. Having conducted similar work with public institutions responsible for implementing urban regeneration projects, I have observed the opposite phenomenon:

1. the urban decor marked by the use of mineral materials, pacified and empty of inhabitants (large scale)
2. idealised social places in artificial images (medium scale)
3. harmless passing residents with uncertain destinations (small scale)

For the public actors that carry out regeneration projects, what is unclear, uncertain and dangerous for urbanity are working-class neighbourhoods that escape urban norms. This explains the justification for municipal interventions: to bring into the urban order what escapes this order in working-class neighbourhoods (waste management, traffic, parking, uses of space deemed transgressive, etc.). The meeting of these two opposing views of public space can explain the conflicts caused by municipal policies (Galhardo, 2018b). The existence of uncertainty about different objects, the impossibility for each to take into account the spatio-temporal scale of the other, and even different conceptions of urban order, all contribute to the emergence of controversies and conflicts. This is where the role of the associations is essential because they attempt to articulate these two types of viewpoints.

How is a researcher situated in these spatio-temporal logics? The researcher has been educated (by his studies and work) for temporalities closer to those of the

institutions than to those of the residents. His thesis was completed in 3 or 5 years, his research programmes are based on timeframes that are barely longer. They are necessarily very distant from the space-time of the residents. Consequently, when they talk about gentrification, they are as Cassandra who is alarmed about the fate of Troy but is not heard by those who live a different story in a different place. What would it take for them to be heard?

I pursued this perspective not from the stance of sociologists, but from that of philosophers interested in the relationship between the individual and space-time (Cohen and Zagury-Orly, 2008; Dastur, 2008), in particular those who reflect within the framework of phenomenology. Heidegger (1927) reminded us that we cannot separate what makes place from what binds it to those who inhabit it. These researchers point to the considerable complexity of the relationship between the individual and space. A complexity consisting of changes in scale, randomness, bricolage, etc. (Lascoumes and Galès, 2005). In daily life, the subject experiences space in a permanent tension between determination and indeterminacy. They are led to deconstruct objective spatial distances by a process known as dislocation, which, according to the authors, reveals 'an essential tendency towards proximity' (Franck, 1986). They are led to do this because it is a question of reducing the uncertainty with which they are constantly confronted.

The author of *Être et le temps* urges us to think about the individual not so much as a "person" understood as an archetype, but as a "being" open to the world whose nature is inscribed in finitude. It is this awareness of finitude that drives individuals to act (individually or collectively) by defining actionable strategies. As we have discovered in our fieldwork, many of the narratives delivered during individual interviews convey anxiety over the end of an order that is linked to the contingencies of their own daily life. Alain Bourdin (1984) devotes several pages to the question of ' guarantee', and concludes his work with the idea that 'objects preserve us from death' (p. 227). He develops the same idea around the question of uncertainty (2012: 30-31) as experienced by each actor in a given place. Intervention in public space is always an accident for the daily life of the inhabitants which plunges them into uncertainty. They are forced to evaluate risk and to think about the consequences for their relationship with the place, before redefining the contours of their daily life and symmetrically redefining their relationship to space.

CONCLUSION: FOR A SCIENCE OF SOCIO-SPATIAL EXPERIENCE

Perec wrote:

> *"I would like there to be stable, immobile, intangible, untouched and almost untouchable places, unchanging, rooted (...). Such places do not exist, and it is because they do not exist that space becomes a question, ceases to be self-evident, ceases to be incorporated, and ceases to be appropriated. Space is a doubt: I must constantly mark it, designate it; it is never mine; it is never given to me, I must conquer it" (1974: 122-123).*

His reflection encapsulates the question of uncertainty and risk, the difficulty of finding a clear and stable spatial definition, such as to understand the link between the actor and space. Perec shows the importance of the body in the appropriation of inhabited space. All these questions are in fact linked.

If our classical concepts have become exhausted, it is because we have not been able to take sufficient account of the 'spatial being' seized by the uncertainty inherent in the contingencies and complexity of daily life. Given the temporal nature of research, and what it implies for the researcher's position, taking into account the 'spatial being' implies an effort to reveal and evaluate the latter's strategies in relation to those of the dominant actors. This forces us to be particularly attentive not only to the methods we use, but also to the "considerable passer-by" (*ibid*, 1984). In the end, assuming that social science manages to take into account and analyse the relations between the strategies of the "spatial being" and those of the "dominant actors", it then becomes a science of experience with a pragmatic aim. In this way, it can both satisfy its commitment to the dominated social categories and construct its own epistemology.

What happens to the classical concepts of *gentrification*, *fragmentation* and *segregation*? They become artefacts capable of unravelling the complexity of socio-spatial dynamics over time. That is to say theoretical models whose simplification can constitute practical tools for the public actor. These tools remain dedicated to observation, reflection, the implementation of field experiments, but should not be confused with scientific knowledge. By not confusing tools and processes, we can hope to produce scientific knowledge and meet the expectations of citizens.

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